JUGONNATH SUNKERSETT
PRESENTATION.

Extract from London Times dated 25th November 1969

£. 90,000 for Audubon set

by GERALDINE KEEN

Sale Room Correspondent

Four volumes containing the 435 plates of Audubon's Birds of America were sold at Sotheby's yesterday for £.90,000 to Mr. Kenneth Nebenzahl, a Chicago book dealer. Times have changed since in the early years of the nineteenth century John James Laforest Audubon, the American naturalist and artist, failed to interest any American publishers in his ambitious project to produce a major fully illustrated work on the birds of America.

Hoping to fare better he came to England. The essential problem was to find an engraver prepared to work on the severa hundred plates he projected and to find enough subscribers fo the work, which was issued in parts. Both were happily foun The work took 11 years to publish, from 1827 to 1838, and by the end of the period the original 300 subscribers had dwindl to about 100.

This tremendously important and decorative work is thus extremely rare. Most sets are in public libraries; in other cases sets have been broken up and the plates sold separately

This was one of the very few complete editions remaining in private hands, and was in unusually fine condition; the plates engraved in aquatint and coloured by hand had hardly suffered over the years. An extra point of interest was the addition of early states of 13 of the plates - early proofs before extra birds were added to the composition. Neverthele the price was remarkable; a less distinguished set was sold for £.21,429 at Parke Bernet in New York in 1966.

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THE

BIRDS OF AMERICA,

FROM

DRAWINGS MADE IN THE UNITED STATES

AND THEIR TERRITORIES.

Fx. n. 16 . 57435

BY

JOHN JAMES AUDUBON, F. R. S., &c., &c.

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BIRDS OF AMERICA.

Genus III.—TACHYPETES, *Vieill.* FRIGATE-BIRD.

Bill longer than the head, strong, broader than high, unless towards the curved extremity; upper mandible with its dorsal line slightly concave, at the tip decurved, its ridge broad and nearly flat at the base, narrowed and more convex towards the end, the sides separated from the ridge by a narrow groove, convex, the edges sharp, direct, irregularly jagged, with a prominence at the commencement of the curve at the elongated, compressed, tapering, decurved point; lower mandible with the angle extremely long, narrow, the membrane bare and dilatable into a small pouch, the very short dorsal line decurved, the sides erect at the base, convex in the rest of their extent, the edges sharp, much inflected, irregularly jagged, at the tip narrow and decurved. Nostrils basal, linear, inconspicuous. Head of moderate size, oblong; neck of moderate length, stout; body rather slender. Feet very short, stout; tibia very short; tarsus extremely short, feathered; toes all placed in the same plane, and connected by short deeply emarginate webs, which run out narrow along the sides, scutellate above, first small, second shorter than fourth, third much longer. Claws strong, compressed, curved, acute, that of the third toe long, with the inner edge pectinate. Plumage compact, glossy; feathers of the head, neck, and back, lanceolate. Wings extremely long, pointed, the first quill longest; the rest rapidly diminishing; secondaries very short, the inner long and tapering. Tail very long, deeply forked, of twelve feathers. Tongue exceedingly small, fleshy, flattened; œsophagus very wide; proventricular glands forming a complete belt; stomach very small, roundish, its muscular coat thin, the inner soft and corrugated; no pyloric lobe; infestine of moderate length; cœca extremely small; cloaca globular.

THE FRIGATE PELICAN.—MAN-OF-WAR-BIRD.

TACHYPETES AQUILUS, *Linn.*

PLATE CCCCXXI.—ADULT.

PREVIOUS to my visit to the Florida Keys, I had seen but few Frigate-birds, and those only at some distance, while I was on the Gulf of Mexico, so that I could merely recognise them by their mode of flight. On approaching Indian Key, however, I observed several of them, and as I proceeded farther south, their numbers rapidly increased; but on the Tortugas very few were observed. This bird rarely travels farther eastward than the Bay of Charleston, in South Carolina, although it is abundant at all seasons from Cape Florida to Cape Sable, the two extreme points of the peninsula. How far south it may be found I cannot tell.

The Frigate Pelicans may be said to be as gregarious as our Vultures. You see them in small or large flocks, according to circumstances. Like our Vultures, they spend the greater part of the day on wing, searching for food; and like them also, when gorged or roosting, they collect in large flocks, either to fan themselves or to sleep close together. They are equally lazy, tyrannical, and rapacious, domineering over birds weaker than themselves, and devouring the young of every species, whenever an opportunity offers, in the absence of the parents; in a word, they are most truly Marine Vultures.

About the middle of May, a period which to me appeared very late for birds found in so warm a climate as that of the Florida Keys, the Frigate Pelicans assemble in flocks of from fifty to five hundred pairs or more. They are seen flying at a great height over the islands on which they have bred many previous seasons, courting for hours together; after which they return towards the mangroves, alight on them, and at once begin to repair the old nests or construct new ones. They pillage each other's nests of their materials, and make excursions for more to the nearest keys. They break the dry twigs of trees with ease, passing swiftly on wing, and snapping them off by a single grasp of their powerful bill. It is indeed a beautiful sight to see them when thus occupied, especially when several are so engaged, passing and repassing with the swiftness of thought over the trees whose tops are blasted; their purpose appears as if accomplished by magic.

Frigate Pelican Man of War bird.

Male

Drawn from Nature by J.J.Audubon F.R.S.F.L.S. Lith.d Printed & Col.d by J.T.Bowen, Philad.a

I know only two other birds that perform the same action: one of them is the Forked-tail Hawk, the other our swift or Chimney Swallow; but neither of them is so expert as the Frigate Pelican. It sometimes happens that this bird accidentally drops a stick while travelling towards its nest, when, if this should happen over the water, it plunges after it and seizes it with its bill before it has reached the waves.

The nests are usually placed on the south side of the keys, and on such trees as hang over the water, some low, others high, several in a single tree, or only one, according to the size of the mangrove, but in some cases lining the whole side of the island. They are composed of sticks crossing each other to the height of about two inches, and are flattish, but not very large. When the birds are incubating, their long wings and tail are seen extending beyond the nest for more than a foot. The eggs are two or three, more frequently the latter number, measure two inches and seven-eighths in length, two in breadth, being thus of a rather elongated form, and have a thick smooth shell, of a greenish-white colour, frequently soiled by the filth of the nests. The young are covered with yellowish-white down, and look at first as if they had no feet. They are fed by regurgitation, but grow tardily, and do not leave the nest until they are able to follow their parents on wing.

At that period the plumage of the young females is marbled with grey and brown, with the exception of the head and the lower parts, which are white. The tail is about half the length it attains at the first moult, and is brownish-black, as are the primaries. After the first change of plumage, the wings become longer, and their flight is almost as elegant and firm as that of older birds.

The second spring plumage of this sex is brownish-black on the upper parts, that colour extending over the head and around the neck in irregular patches of brown, continued in a sharp angle towards the breast, but separated on its sides by the white that ascends on either side of the neck towards the head. The lower tail-coverts are brownish-black, as are the lower parts of the belly and flanks; the shoulders alone remaining as at first. The tail and the wings are perfect.

The third spring, the upper parts of the head and neck are of a purer brownish-black, which extends down to the extremity of the angle, as are the feathers of the belly and the lower tail-coverts, the dark colour reaching now to within five inches of the angle on the breast. The white of the intermediate space has become much purer; here and there light tints of bronze appear; the feet, which at first were dull yellow, have become of a rich reddish-orange, and the bill is pale blue. The bird is now capable of

breeding, although its full plumage is not obtained until the next moult, when the colours become glossy above, and the white of the breast pure.

The changes which the males undergo are less remarkable. They are at first, when fully fledged, entirely of the colour seen on the upper parts of the young females; and the tint is merely improved afterwards, becoming of a deeper brownish-black, and acquiring purer reflections of green, purple and bronze, which in certain lights are seen on every part of the head, neck, and body, and in very old males on the wings and tail. They also commence breeding the third spring. But I now return to the habits of this interesting bird.

The Frigate Pelican is possessed of a power of flight which I conceive superior to that of perhaps any other bird. However swiftly the Cayenne Tern, the smaller Gulls or the Jager move on wing, it seems a matter of mere sport to it to overtake any of them. The Goshawk, the Peregrine, and the Gyr Falcon, which I conceive to be the swiftest of our Hawks, are obliged to pursue their victim, should it be a Green-winged Teal or Passenger Pigeon, at times for half a mile, at the highest pitch of their speed, before they can secure them. The bird of which I speak comes from on high with the velocity of a meteor, and on nearing the object of its pursuit, which its keen eye has spied while fishing at a distance, darts on either side to cut off all retreat, and with open bill forces it to drop or disgorge the fish which it has just caught. See him now! Yonder, over the waves leaps the brilliant dolphin, as he pursues the flying-fishes, which he expects to seize the moment they drop into the water. The Frigate-bird, who has marked them, closes his wings, dives toward them, and now ascending, holds one of the tiny things across his bill. Already fifty yards above the sea, he spies a porpoise in full chase, launches towards the spot, and in passing seizes the mullet that had escaped from its dreaded foe; but now, having obtained a fish too large for his gullet, he rises, munching it all the while, as if bound for the skies. Three or four of his own tribe have watched him and observed his success. They shoot towards him on broadly extended pinions, rise in wide circles, smoothly, yet as swiftly as himself. They are now all at the same height, and each as it overtakes him, lashes him with its wings, and tugs at his prey. See! one has fairly robbed him, but before he can secure the contested fish it drops. One of the other birds has caught it, but he is pursued by all. From bill to bill, and through the air, rapidly falls the fish, until it drops quite dead on the waters, and sinks into the deep. Whatever disappointment the hungry birds feel, they seem to deserve it all.

Sights like these you may every day see, if you take ship and sail for the Florida Keys. I have more to tell you, however, and of things that to me were equally pleasing. While standing in the cool veranda of Major Glas-

SEL of the United States army, at Key West, I observed a Frigate Pelican that had forced a Cayenne Tern, yet in sight, to drop a fish, which the broad-winged warrior had seized as it fell. This fish was rather large for the Tern, and might probably be about eight inches in length. The Frigate Pelican mounted with it across his bill about a hundred yards, and then tossing it up caught it as it fell, but not in the proper manner. He therefore dropped it, but before it had fallen many yards, caught it again. Still it was not in a good position, the weight of the head, it seemed, having prevented the bird from seizing it by that part. A second time the fish was thrown upwards, and now at last was received in a convenient manner, that is, with its head downwards, and immediately swallowed.

When the morning light gladdens the face of nature, and while the warblers are yet waiting in silence the first rays of the sun, whose appearance they will hail with songs of joy, the Frigate-bird, on extended pinions, sails from his roosting place. Slowly and gently, with retracted neck he glides, as if desirous of quietly trying the renovated strength of his wings. Toward the vast deep he moves, rising apace, and before any other bird views the bright orb emerging from the waters. Pure is the azure of the heavens, and rich the deep green of the smooth sea below; there is every prospect of the finest weather; and now the glad bird shakes his pinions; and far up into the air, far beyond the reach of man's unaided eye, he soars in his quiet but rapid flight. There he floats in the pure air, but thither can fancy alone follow him. Would that I could accompany him! But now I see him again, with half-closed wings, gently falling towards the sea. He pauses awhile, and again dives through the air. Thrice, four times, has he gradually approached the surface of the ocean; now he shakes his pinions as violently as the swordsman whirls his claymore; all is right; and he sweeps away, shooting to this side and that, in search of prey.

Mid-day has arrived, and threatening clouds obscure the horizon; the breeze, ere felt, ruffles the waters around; a thick mist advances over the deep; the sky darkens, and as the angry blasts curl the waves, the thunder mutters afar; all nature is involved in gloom, and all is in confusion, save only the Man-of-war-bird, who gallantly meets the gale. If he cannot force his way against the storm, he keeps his ground, balancing himself like a Hawk watching his prey beneath; but now the tempest rages, and rising obliquely, he shoots away, and ere long surmounts the tumultuous clouds, entering a region calm and serene, where he floats secure until the world below has resumed its tranquillity.

I have frequently observed the Frigate-bird scratch its head with its feet while on wing; and this happening one day, when the bird fell through the air, as it is accustomed to do at such times, until it came within shot, I killed

it when almost over my head, and immediately picked it up. I had been for years anxious to know what might be the use of the pectinated claws of birds; and on examining both its feet with a glass, I found the racks crammed with insects, such as occur on the bird's head, and especially around the ears. I also observed that the pectinated claws of birds of this species were much longer, flatter, and more comb-like than those of any other species with which I am acquainted. I now therefore feel convinced, that however useful this instrument may be on other occasions, it is certainly employed in cleansing parts of the skin of birds which cannot be reached by the bill.

At times these birds may be seen chasing and jostling each other as if engaged in a frolic, after which they bear away on extended wings, and fly in a direct course until out of sight. But although their flight is easy and powerful, in a degree not surpassed by any other bird, they move with great difficulty on the ground. They can rise, however, from a sand-bar, no matter how low and level it may be. At such times, as well as when sitting on the water, which it occasionally does, the bird raises its wings almost perpendicularly, spreads its tail half erect, and at the first flap of the former, and simultaneous stroke of the latter, on the ground or the water, bounces away. Its feet, however, are of little service beyond what I have mentioned, and the supporting of its body when it has alighted on a branch, on which it rarely stands very erect, although it moves sideways on it, as Parrots sometimes do. It never dives, its bill in form resembling that of the Cormorants, which also never plunge from on wing in pursuit of fish, and only dip into the water when dropping from a perch or a rock to escape danger, as the Anhingas and some other birds are also accustomed to do.

When the Frigate Pelican is in want of a dead fish, a crab, or any floating garbage suited to its appetite, it approaches the water in the manner of Gulls, holding its wings high, and beating them until the bill has performed its duty, which being accomplished, the bird immediately rises in the air and devours its prey.

These birds see well at night, although they never go to sea excepting by day. At various times I have accidentally sailed by mangrove keys on which hundreds were roosted, and apparently sound asleep, when, on my firing a gun for the purpose of starting whatever birds might be there, they would all take to wing and sail as beautifully as during day, returning to the trees as the boats proceeded. They are by no means shy; indeed they seem unaware of danger from a gun, and rarely all go off when a party is shooting at them, until a considerable number has been obtained. The only difficulty I experienced in procuring them was on account of the height to which they so soon rose on leaving the trees; but we had excellent guns, and our worthy

pilot's "Long Tom" distinguished itself above the rest. At one place, where we found many hundreds of them, they sailed for nearly half an hour over our heads, and about thirty were shot, some of them at a remarkable height, when we could hear the shot strike them, and when, as they fell to the water, the sound of their great wings whirling through the air resembled that produced by a sail flapping during a calm. When shot at and touched ever so slightly, they disgorge their food in the manner of Vultures, Gulls and some Terns; and if they have fallen and are approached, they continue to vomit the contents of their stomach, which at times are extremely putrid and nauseous. When seized, they evince little disposition to defend themselves, although ever so slightly wounded, but struggle and beat themselves until killed. Should you, however, place your fingers within their open bill, you might not withdraw them scatheless.

They are extremely silent, and the only note which I heard them utter was a rough croaking one. They devour the young of the Brown Pelican when quite small, as well as those of other birds whose nests are flat and exposed during the absence of the parent birds; but their own young suffer in the same manner from the still more voracious Turkey Buzzard. The notion that the Frigate-bird forces the Pelicans and Boobies to disgorge their prey is erroneous. The Pelican, if attacked or pursued by this bird, could alight on the water or elsewhere, and by one stroke of its sharp and powerful bill destroy the rash aggressor. The Booby would in all probability thrust its strong and pointed bill against the assailant with equal success. The Cayenne Tern, and other species of that genus, as well as several small Gulls, all abundant on the Florida coasts, are its purveyors, and them it forces to disgorge or drop their prey. Those of the deep are the dolphins, porpoises, and occasionally the sharks. Their sight is wonderfully keen, and they now and then come down from a great height to pick up a dead fish only a few inches long floating on the water. Their flesh is tough, dark, and, as food, unfit for any other person than one in a state of starvation.

TACHYPETES AQUILUS, Bonap. Syn., p. 406.
FRIGATE PELICAN, Nutt. Man., vol. ii. p. 491.
FRIGATE PELICAN, *Tachypetes Aquilis*, Aud. Orn. Biog., vol. iii. p. 495: vol. v. p. 634.

Adult, 41, 86.

Resides constantly on and about the Florida Keys, where it breeds in vast numbers on trees. Ranges over the Gulf of Mexico, Bays of Texas, but rarely seen to the eastward of North Carolina.

Adult Male.

Bill much longer than the head, strong, broader than deep, excepting

towards the curved extremity, the edges irregularly jagged. Upper mandible with the dorsal line slightly concave, at the tip decurved, its ridge broad and nearly flat at the base, narrowed and more convex towards the end, the sides separated from the ridge by a narrow groove, convex, the edges sharp and inflected, with a prominence at the commencement of the curve of the elongated compressed hooked point. Nostrils basal, linear, inconspicuous. Lower mandible with the angle extremely long, narrow, the membrane bare and dilatable into a small pouch, the very short dorsal line decurved, the sides erect at the base, convex in the rest of their extent, the edges sharp and much inflected, at the narrow tip decurved.

Head of moderate size, oblong. Neck of moderate length, stout. Body rather slender. Feet very short, stout; tibia very short; tarsus extremely short, feathered; toes all placed in the same plane, and connected by short reticulated webs with concave margins, but running narrow along the sides; they are scutellate above, broad and papillate beneath; first toe small, second shorter than fourth, third much longer than the latter. Claws strong, compressed, curved, acute, that of middle toe long, obliquely flattened, and pectinate on the inner edge.

Eyelids and gular sac, with the interior part of the neck, bare. Plumage compact, on the head, neck, breast, and back, shining. The feathers of the head, neck, and back are lanceolate and acuminate; of the breast and sides broader; of the wings small and rounded. Wings extremely long, pointed, the first quill longest, the rest rapidly diminishing; the secondaries very short, obliquely rounded and acuminate, the inner long and tapering. Tail very long, deeply forked, of twelve rounded feathers, the outer narrow and abruptly rounded.

Bill light purplish-blue, white in the middle, the curved tips dusky. Inside of mouth carmine; gular sac orange. Bare space about the eye purplish-blue; iris deep brown. Feet light carmine above, orange beneath. The general colour of the plumage is brownish-black, the head, neck, back, breast, and sides, splendent with green and purple reflections, the former predominating on the head, the latter on the back. The wings are tinged with grey, the inner secondaries and tail with brown; the shafts of the former black, of the latter brown.

I have observed in specimens which I considered to be very old, that the gular sac was covered with pustules, similar to those found at times around the base of the mandibles of the *Cathartes Aura*, and which appear to be the effects of disease, occasioned by their coming frequently in contact with putrid substances.

Length to end of tail 41 inches, to end of wings 37, to end of claws 24¾; wing from flexure 25, tail 18; extent of wings 86; bill along the back 5½,

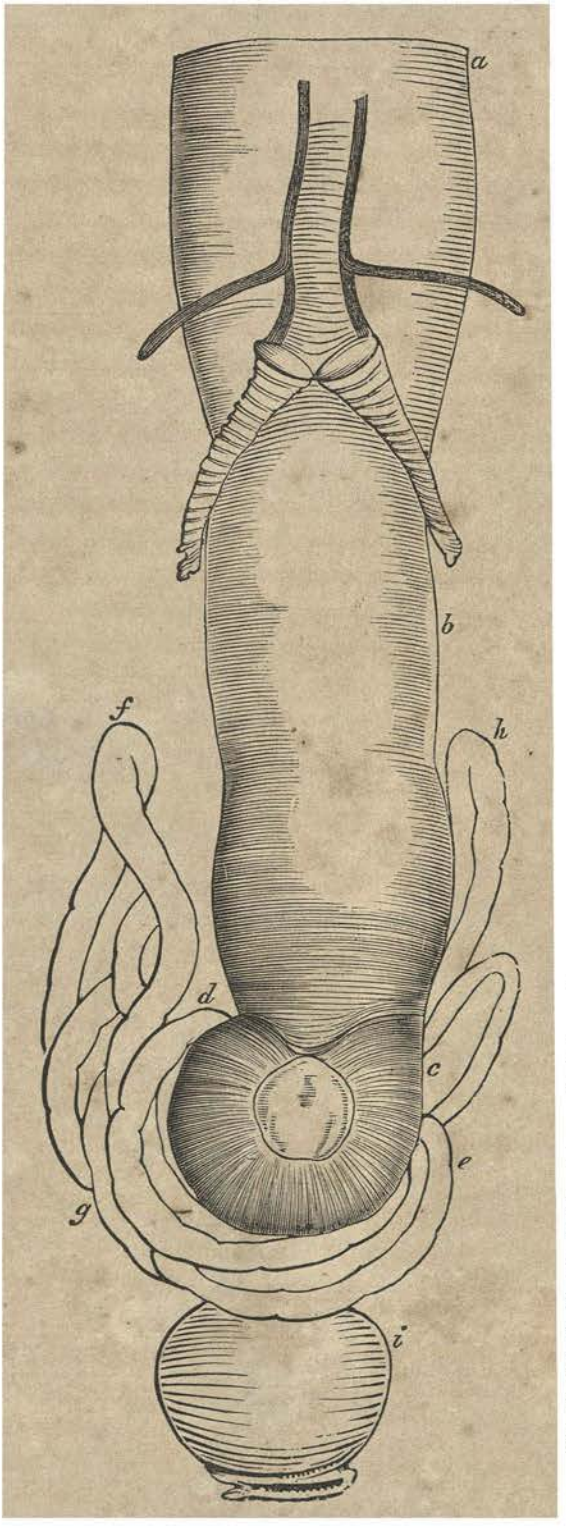
along the edge of lower mandible $5\frac{7}{12}$; tarsus $\frac{3}{4}$; middle toe $2\frac{1}{4}$, its claw $\frac{10}{12}$. Weight 3 lbs. 6 oz.

The Adult Female differs from the male in several respects. The former has the whole plumage dark-coloured, whereas the latter has a broad white space on the breast, that colour extending forwards along the sides of the neck, and encircling it about the middle. The feathers of the back are less elongated and pointed, and their lustre is much inferior to that of the male. The dark parts also are more tinged with brown, and most of the smaller wing-coverts are of the latter colour.

Male. As in the Gannets and Pelicans, the cells of the subcutaneous cellular tissue are extremely large and distensile. The mouth is very wide, its breadth being 1 inch 7 twelfths, opening to nearly beneath the posterior angle of the eye. The palate is convex, with two horny thin-edged ridges, and anteriorly a median ridge of the same kind extending to the tip. The posterior aperture of the nares is linear, $1\frac{1}{4}$ inches in length. The lower mandible is extremely narrow toward the end, and deeply grooved, with a kind of joint on each side near the base, rendering it capable of being extended to 2 inches 5 twelfths. The tongue is similar to that of the Pelicans, Gannets, and Cormorants, being exceedingly small, $7\frac{1}{2}$ twelfths in length, fleshy, flattened, $4\frac{1}{2}$ twelfths in breadth at the base, 2 twelfths at the middle, the tip obtuse. The nostrils, which are situated at the commencement of the groove on each side of the ridge, are so inconspicuous as to be with difficulty detected, being quite linear, $3\frac{1}{2}$ twelfths long, and covered above by a membranous edge. The aperture of the ear is of moderate size, 3 twelfths in width; that of the eye is $\frac{1}{2}$ inch.

The heart is of an ovate form, broader and rounder than usual, its length 1 inch $4\frac{1}{2}$ twelfths, its breadth 1 inch 2 twelfths. The lobes of the liver are very unequal, the right being 2 inches 1 twelfth long, the left 1 inch 5 twelfths; the gall-bladder oblong, 9 twelfths in length, 5 twelfths in breadth.

The œsophagus, *a b c*, is $11\frac{1}{2}$ inches long, at the commencement $2\frac{3}{4}$ inches in width, presently contracting to 1 inch 9 twelfths, at the lower part of the neck expanded to 2 inches, within the thorax 1 inch 4 twelfths; the proventriculus, *b c*, 1 inch 5 twelfths, its belt of glandules complete, 1 inch 2 twelfths in breadth, 7 prominent rugæ. The stomach, *c d*, is very small, roundish, 1 inch 4 twelfths in diameter, considerably compressed; its muscular coat very thin, consisting of a single series of fasciculi; the tendons circular, $\frac{1}{2}$ inch in diameter; its inner coat soft and corrugated, several of the proventricular rugæ running down upon it. The walls of the œsophagus are of moderate thickness, the external transverse fibres distinct, the inner coat longitudinally plaited. The stomach differs from that of all the other



Pelecaninæ in having no pyloric lobe. The duodenum also, *d e f*, does not at first pass forward, but directly curves round the stomach, returning at the distance of 2½ inches, and the intestine, *d e f g h i*, is convoluted with 9 folds. It is 36 inches long, 5 twelfths wide in the duodenal portion, contracts to 3 twelfths; the cœca are two small knobs 2 twelfths long, 1½ twelfths in breadth; the rectum 3 inches long, for 1 inch 8 twelfths its width is 3½ twelfths, the remaining part forming a globular cloaca 1½ inches in diameter.

The trachea is 8½ inches long, its width at the commencement 4½ twelfths, presently after 4 twelfths, contracting to 3¾ twelfths. It is a little flattened: the rings 112, cartilaginous. The inferior larynx is greatly expanded antero-posteriorly, and the first dimidiate ring is 5 twelfths in extent, with a somewhat smaller ring beyond it. The lateral muscles are very slender; the sterno-tracheal, which passes off at the distance of ½ inch from the bifurcation, is strong; there is a slender slip on each side going to the

bronchial membrane. The bronchi are wide, and formed of 20 half rings.

The sternum is extremely singular, on account of its great width and concavity, compared with its length; the latter being only 2¼ inches, while the breadth at the anterior costal processes is 2½ inches. The crest is thus extremely short, but of considerable height, its most prominent part being 10½ twelfths. The coracoid bones are remarkably large, and so firmly fixed in the joint as to have just the slightest perceptible motion. The furcula is also very large and wide, of the form of the letter U, its crura at their union forming a large mass of solid bone, continuous with the crest of the sternum. The posterior edge of the sternum has a very slight sinus on each side.

Now, in this bird, which is confessed to be inferior to none in its power of flight, the sternal crest is not nearly so prominent as that of a Grouse or Partridge, so that the supposed indication which this part affords of vigorous flight is evidently fallacious. The sternum, although much shorter, resembles that of the Pelicans, Cormorants, and Anhingas, as well as in a less degree that of the Gannets.

Genus IV.—PELECANUS, *Linn.* PELICAN.

Bill about thrice the length of the head, rather slender, almost straight, depressed; upper mandible linear, depressed, convex at the base, gradually flattened, and a little enlarged to near the end, when it narrows, and terminates in a hooked point; ridge broad and convex at the base, gradually narrowed and flattened beyond the middle, separated by a groove from the sides, erect at the base, sloping towards the edges, edges very acute, with an internal groove; lower mandible with the angle excessively long, extending to the unguis, the sides erect and convex, the edges thin and involute, the tip decurved. Nostrils basal, lateral, linear, concealed by the wrinkles of the skin. Head small, oblong; neck long, stout; body full, rather flattened. Feet short, and very stout; tarsus short, compressed, covered all round with hexagonal scales; toes in the same plane, all connected by webs, first shortest, fourth longer than third. Claws short, strong, curved, that of the third

toe pectinate. Feathers of head and neck exceedingly small, slender, downy; of the other parts generally lanceolate and acuminate; wings very long, rather narrow, rounded; primaries much curved. Tail short, broad, rounded, of more than sixteen feathers. An enormous bare, extensile, gular sac; tongue extremely small, papilliform; œsophagus excessively wide; proventricular glands arranged in broad longitudinal series; stomach very small, with its muscular coat thin, its epithelium smooth and soft; a globular pyloric lobe; intestine long and narrow; cœca very small, cylindrical; cloaca globular.

AMERICAN WHITE PELICAN.

PELECANUS AMERICANUS, *Aud.*

PLATE CCCCXXII.—ADULT MALE.

I feel great pleasure, good reader, in assuring you that our White Pelican, which has hitherto been considered the same as that found in Europe, is quite different. In consequence of this discovery, I have honoured it with the name of my beloved country, over the mighty streams of which, may this splendid bird wander free and unmolested to the most distant times, as it has already done from the misty ages of unknown antiquity.

In Dr. RICHARDSON'S Introduction to the second volume of the Fauna Boreali-Americana, we are informed, that the *Pelecanus Onocrotalus* (which is the bird now named *P. Americanus*) flies in dense flocks all the summer in the Fur Countries. At page 472, the same intrepid traveller says, that "Pelicans are numerous in the interior of the Fur Countries up to the sixty-first parallel; but they seldom come within two hundred miles of Hudson's Bay. They deposit their eggs usually on rocky islands, on the brink of cascades, where they can scarcely be approached; but they are otherwise by no means shy birds." My learned friend also speaks of the "long thin bony process seen on the upper mandible of the bill of this species;" and although neither he nor Mr. SWAINSON pointed out the actual differences otherwise existing between this and the European species, he states that no such appearance has been described as occurring on the bills of the White Pelicans of the old Continent.

W.H

American White Pelican.

Male.

Drawn from Nature by J.J.Audubon.F.R.S.F.L.S. Lith.ª Printed & Col.ª by J. T. Bowen, Phila.ª

When, somewhat more than thirty years ago, I first removed to Kentucky, Pelicans of this species were frequently seen by me on the sand-bars of the Ohio, and on the rock-bound waters of the rapids of that majestic river, situated, as you well know, between Louisville and Shippingport. Nay, when, a few years afterwards, I established myself at Henderson, the White Pelicans were so abundant that I often killed several at a shot, on a well known sand-bar, which protects Canoe Creek Island, During those delightful days of my early manhood, how often have I watched them with delight! Methinks indeed, reader, those days have returned to me, as if to enable me the better once more to read the scattered notes contained in my often-searched journals.

Ranged along the margins of the sand-bar, in broken array, stand a hundred heavy-bodied Pelicans. Gorgeous tints, all autumnal, enrich the foliage of every tree around, the reflection of which, like fragments of the rainbow, seems to fill the very depths of the placid and almost sleeping waters of the Ohio. The subdued and ruddy beams of the orb of day assure me that the Indian summer has commenced, that happy season of unrivalled loveliness and serenity, symbolic of autumnal life, which to every enthusiastic lover of nature must be the purest and calmest period of his career. Pluming themselves, the gorged Pelicans patiently wait the return of hunger. Should one chance to gape, all, as if by sympathy, in succession open their long and broad mandibles, yawning lazily and ludicrously. Now, the whole length of their largest quills is passed through the bill, until at length their apparel is as beautifully trimmed as if the party were to figure at a route. But mark, the red beams of the setting-sun tinge the tall tops of the forest trees; the birds experience the cravings of hunger, and to satisfy them they must now labour. Clumsily do they rise on their columnar legs, and heavily waddle to the water. But now, how changed do they seem! Lightly do they float, as they marshal themselves, and extend their line, and now their broad paddle-like feet propel them onwards. In yonder nook, the small fry are dancing in the quiet water, perhaps in their own manner bidding farewell to the orb of day, perhaps seeking something for their supper. Thousands there are, all gay, and the very manner of their mirth, causing the waters to sparkle, invites their foes to advance toward the shoal. And now the Pelicans, aware of the faculties of their scaly prey, at once spread out their broad wings, press closely forward with powerful strokes of their feet, drive the little fishes toward the shallow shore, and then, with their enormous pouches spread like so many bag-nets, scoop them out and devour them in thousands.

How strange it is, reader, that birds of this species should be found breeding in the Fur Countries, at about the same period when they are to be found

on the waters of the inland bays of the Mexican Gulf! On the 2nd of April, 1837, I met with these birds in abundance at the south-west entrance or mouth of the Mississippi, and afterwards saw them in the course of the same season, in almost every inlet, bay, or river, as I advanced toward Texas, where I found some of them in the Bay of Galveston, on the 1st of May. Nay, while on the island of Grand Terre, I was assured by Mr. ANDRY, a sugar-planter, who has resided there for some years, that he had observed White Pelicans along the shores every month of the year. Can it be, that in this species of bird, as in many others, barren individuals should remain in sections of countries altogether forsaken by those which are reproductive? The latter we know, travel to the Rocky Mountains and the Fur Countries of the north, and there breed. Or do some of these birds, as well as of certain species of our Ducks, remain and reproduce in those southern localities, induced to do so by some organic or instinctive peculiarity? Ah, reader, how little do we yet know of the wonderful combinations of Nature's arrangements, to render every individual of her creation comfortable and happy under all the circumstances in which they may be placed!

My friend JOHN BACHMAN, in a note to me, says that "this bird is now more rare on our coast than it was thirty years ago; for I have heard it stated that it formerly bred on the sand banks of our Bird Islands. I saw a flock on the Bird Banks off Bull's Island, on the 1st day of July, 1814, when I procured two full-plumaged old birds, and was under the impression that they had laid eggs on one of those banks, but the latter had the day previous to my visit been overflowed by a spring tide, accompanied with heavy wind."

A single pair of our White Pelicans were procured not far from Philadelphia, on the Delaware or Schuylkill, ten or twelve years ago, and one or two have been shot on the upper waters of the Hudson. These were the only birds of this kind that, I believe, were ever observed in our Middle Districts, where even the Brown Pelican, *Pelecanus fuscus*, is never seen. From these facts, it may be concluded that the White Pelicans reach the Fur Countries of Hudson's Bay by inland journeys, and mostly by passing along our great western rivers in the spring months, as they are also wont to do, though with less rapid movements, in autumn.

Reader, I have thought a thousand times perhaps that the present state of migration of many of our birds, is in a manner artificial, and that a portion of the myriads of Ducks, Geese, and other kinds, which leave our Southern Districts every spring for higher latitudes, were formerly in the habit of remaining and breeding in every section of the country that was found to be favourable for that purpose. It seems to me that it is now on account of the difficulties they meet with, from the constantly increasing numbers of our

hostile species, that these creatures are urged to proceed towards wild and uninhabited parts of the world, where they find that security from molestation necessary to enable them to rear their innocent progeny, but which is now denied them in countries once their own.

The White American Pelican never descends from on wing upon its prey, as is the habit of the Brown Pelican; and, although on many occasions it fishes in the manner above described, it varies its mode according to circumstances, such as a feeling of security, or the accidental meeting with shoals of fishes in such shallows as the birds can well compass. They never dive for their food, but only thrust their head into the waters as far as their neck can reach, and withdraw it as soon as they have caught something, or have missed it, for their head is seldom out of sight more than half a minute at a time. When they are upon rivers, they usually feed along the margin of the water, though, I believe, mostly in swimming depth, when they proceed with greater celerity than when on the sand. While thus swimming, you see their necks extended, with their upper mandible only above the water, the lower being laterally extended, and ready to receive whatever fish or other food may chance to come into the net-like apparatus attached to it.

As this species is often seen along the seashores searching for food, as well as on fresh water, I will give you a description of its manners there. While on the Island of Barataria in April, 1837, I one afternoon observed a number of White Pelicans swimming against the wind and current, with their wings partially extended, and the neck stretched out, the upper mandible alone appearing above the surface, while the lower must have been used as a scoop-net, as I saw it raised from time to time, and brought to meet the upper, when the whole bill immediately fell to a perpendicular position, the water was allowed to run out, and the bill being again raised upwards, the fish was swallowed. After thus swimming for about a hundred yards in an extended line, and parallel to each other, they would rise on wing, wheel about, and re-alight at the place where their fishing had commenced, when they would repeat the same actions. I continued watching them more than an hour, concealed among a large quantity of drifted logs, until their fishing was finished, when they all flew off to the lee of another island, no doubt to spend the night there, for these birds are altogether diurnal. When gorged, they retire to the shores, to small islands in bays or rivers, or sit on logs floating in shallow water, at a good distance from the beach; in all which situations they are prone to lie down, or stand closely together.

Being anxious, when on my last expedition, to procure several specimens of these birds for the purpose of presenting you with an account of their anatomical structure, I requested all on board our vessel to shoot them on all occasions; but no birds having been procured, I was obliged to set out with

a "select party" for the purpose. Having heard some of the sailors say that large flocks of White Pelicans had been seen on the inner islets of Barataria Bay, within the island called Grande Terre, we had a boat manned, and my friend EDWARD HARRIS, my son, and myself, went off in search of them. After awhile we saw large flocks of these birds on some grounded logs, but found that it was no easy matter to get near them, on account of the shallowness of the bay, the water being scarcely two feet in depth for upwards of half a mile about us. Quietly, and with all possible care, we neared a flock; and strange it was for me to be once more within shooting distance of White Pelicans. It would no doubt be a very interesting sight to you, were you to mark the gravity and sedateness of some hundreds of these Pelicans, closely huddled together on a heap of stranded logs, or a small bank of racoon oysters. They were lying on their breasts, but as we neared them they all arose deliberately to their full height. Some, gently sliding from the logs, swam off towards the nearest flock, as unapprehensive of danger as if they had been a mile distant. But now their bright eyes were distinctly visible to us, our guns, charged with buckshot, were in readiness, and my son was lying in the bow of the boat waiting for the signal. "Fire!"—The report is instantly heard, the affrighted birds spread their wings and hurry away, leaving behind three of their companions floating on the water. Another shot from a different gun brought down a fourth from on wing; and as a few were scampering off wounded, we gave chase, and soon placed all our prizes in the after sheets. About a quarter of a mile farther on, we killed two, and pursued several that were severely wounded in the wing, but they escaped, for they swam off so rapidly that we could not propel our boat with sufficient speed to catch them amidst the tortuous shallows. The Pelicans appeared tame, if not almost stupid; and at one place, where there were about sixty on an immense log, could we have gone twenty yards nearer, we might have killed eight or ten at a single discharge. But we had already a full cargo, and therefore returned to the vessel, on the decks of which the wounded birds were allowed to roam at large. We found these Pelicans hard to kill, and some which were perforated with buckshot did not expire until eight or ten minutes after they were fired at. A wonderful instance of this tenacity of life was to be seen on board a schooner then at anchor in the harbour. A Pelican had been grazed on the hind part of the head with an ounce ball from a musket, and yet five days afterwards it was apparently convalescent, and had become quite gentle. When wounded, they swim rather sluggishly, and do not attempt to dive, or even to bite, like the Brown Pelicans, although they are twice as large, and proportionally stronger. After being shot at, they are perfectly silent, but when alighted they utter a

hollow guttural sound somewhat resembling that produced by blowing through the bung-hole of a cask.

The White Pelicans appear almost inactive during the greater part of the day, fishing only soon after sunrise, and again about an hour before sunset; though at times the whole flock will mount high in the air, and perform extended gyrations in the manner of the Hooping Crane, Wood Ibis, and Vultures. These movements are probably performed for the purpose of assisting their digestion, and of airing themselves, in the higher and cooler regions of the atmosphere. Whilst on the ground, they at times spread their wings to the breeze, or to the rays of the sun; but this act is much more rarely performed by them than by the Brown Pelicans. When walking, they seem exceedingly awkward, and like many cowardly individuals of our own species, are apt to snap at objects which they appear to know perfectly to be so far superior to them as to disdain taking notice of them. Their usual manner of flight is precisely similar to that of our Brown species. It is said by authors that the White Pelican can alight on trees; but I have never seen a single instance of its doing so. I am of opinion that the ridge projecting from the upper mandible increases in size as the bird grows older, and that it uses that apparatus as a means of defence or of attack, when engaged with its rivals in the love-season.

The number of small fishes destroyed by a single bird of this species may appear to you, as it did to me, quite extraordinary. While I was at General HERNANDEZ's plantation in East Florida, one of them chanced to pass close over the house of my generous host, and was brought dead to the ground. It was not a mature bird, but apparently about eighteen months old. On opening it, we found in its stomach several hundreds of fishes, of the size of what are usually called minnows. Among the many which I have at different times examined, I never found one containing fishes as large as those commonly swallowed by the Brown species, which, in my opinion, is more likely to secure a large fish by plunging upon it from on wing, than a bird which must swim after its prey.

This beautiful species,—for, reader, it is truly beautiful, and you would say so were you to pick it up in all the natural cleanness of its plumage, from the surface of the water,—carries its crest broadly expanded, as if divided into two parts from the centre of the head. The brightness of its eyes seemed to me to rival that of the purest diamond; and in the love-season, or the spring of the year, the orange-red colour of its legs and feet, as well as of the pouch and bill, is wonderfully enriched, being as represented in my plate, while during the autumnal months these parts are pale. Its flesh is rank, fishy, and nauseous, and therefore quite unfit for food, unless in cases of extreme necessity. The idea that these birds are easily caught

when gorged with fish, is quite incorrect, for when approached, on such an occasion, they throw up their food, as Vultures are wont to do.

I regret exceedingly that I cannot say any thing respecting their nests, eggs, or young, as I have not been in the countries in which they are said to breed.

AMERICAN WHITE PELICAN, *Pelecanus americanus*, Aud. Ord. Biog., vol. iv. p. 88.

Male, 61¾, 103; bill, 13¾.

Common during winter from Texas to South Carolina, both along the coast and about the lakes and rivers adjoining the Missouri, Mississippi, and Ohio. Breeds from California northward to lat. 61°. Accidental in the Middle Atlantic Districts.

Adult Male.

Bill a little more than thrice the length of the head, rather slender, almost straight, depressed. Upper mandible linear, depressed, convex at the base, gradually flattened and a little enlarged to near the end, when it again narrows, and terminates in a hooked point. The ridge is broad and convex at the base, becomes gradually narrowed and flattened beyond the middle, is elevated into a thin crest about an inch high, of a fibrous structure, and about three inches in length (in some specimens as much as five inches) which is continued forwards of less elevation to the extent of an inch farther. The ridge of the mandible is then narrow and flat, and terminates in the unguis, which is oblong, slightly carinate above, curved, obtuse, concave beneath. The edges are very sharp and a little involute; the lower surface of the mandible has a median slender sharp ridge, on each side of which, at the distance of a quarter of an inch, is a stronger ridge having a groove in its whole length; the sides then slope upwards to the incurved margin, and in this latter space is received the edge of the other mandible. Lower mandible having its crura separated, very slender, elastic, and meeting only at the very extremity, so that the angle or interspace may be described as extremely long, occupying in fact the whole length of the bill excepting four-twelfths of an inch at the end; for two-thirds of its length from the base, the lower mandible is broader than the upper, which is owing to the crura lying obliquely, but beyond the crest it is narrower; the extremely short dorsal line ascending, convex, the edges inflected, sharp, and longitudinally grooved. To the lower mandible, in place of the skin or membrane filling up the angle as in most other birds, is appended a vast sac seven inches in depth opposite the base of the bill, and extending down the throat about eight inches, so that its length from the tip of the lower mandible is twenty-one and a half inches. It is formed of the skin, which is thin, transparent, elastic, rugous, highly vas-

cular, and capable of being expanded like a net, supported by the elastic mandibles to the breadth of nine and a half inches.

Head small, oblong; neck long, stout; body full, rather flattened. Feet short and very stout; tibia bare at its lower part, covered all round with small scales; tarsus short, very stout, compressed, covered all round with hexagonal scales, of which the anterior are much larger; toes in the same plane, all connected by reticulated webs, the first shortest, the second an inch shorter than the fourth, which is considerably longer than the third, scaly at the base, scutellate over the rest of their extent. Claws short, strong, curved, rather blunt, that of the middle toe with a sharp pectinate inner edge.

Feathers of the head and neck exceedingly small, slender, and of a downy texture, those on the fore part of the head a little more compact; on the nape they are elongated, acuminate, and form a longitudinal narrow crest, which runs down the back of the neck. The feathers in general are lanceolate, acuminate, and of moderately dense texture; those at the junction of the neck and breast anteriorly are stiffer and more elongated. Wings very long, rather narrow, rounded; the humerus and cubitus very long in proportion; primaries much curved; secondaries rather narrow, also incurved toward the end, the inner extending when the wing is closed far beyond the tips of the primaries. Tail short, broad, rounded, of *twenty-four* feathers, which are broad and abruptly acuminate.

Bill bare, space about the eye, and feet, rich bright yellow, becoming brighter before their departure for their breeding grounds; claws yellowish-brown; tip of the bill brighter than the rest. Iris white, in younger birds dusky. The general colour of the plumage is pure white; the crest, the elongated feathers on the fore part of the breast, and those near the edge of the cubitus, pale yellow. The alula, primary coverts, and primary quills, black, the shafts white, becoming brownish-black toward the end. The inner ten secondaries are white, the rest black, more or less tipped with greyish-white, their bases white, that colour more extended on the inner than the outer, the shafts of all the quills white beneath, those of the secondaries tinged with grey.

Dimensions of an old male. Length to end of tail 61$\frac{3}{4}$ inches, to end of wing 61$\frac{3}{4}$, to end of claws 66$\frac{3}{4}$, from the point of the bill to the carpal joint 40; extent of wings 103; wing from flexure 24$\frac{1}{2}$; length of cubitus 15; tail 6$\frac{1}{4}$; bill along the ridge 13$\frac{3}{4}$, along the edge of lower mandible 15; breadth of lower mandible at the base 2; bare part of tibia 1; tarsus 4$\frac{8}{12}$; middle toe 4$\frac{1}{2}$, its claw $\frac{5}{8}$; outer toe 4$\frac{1}{2}$, its claw $\frac{6}{12}$; inner toe 3, its claw $\frac{7}{12}$; hind toe 1$\frac{3}{4}$, its claw $\frac{8}{12}$. Weight 17$\frac{1}{2}$ lbs.

The Female is rather less, and in as far as I am warranted by the exami-

nation of several individuals in stating, is destitute of the horny crest of the upper mandible.

A male, shot near Grande Terre, in the Gulf of Mexico, examined. The skin is very thin, but the subcutaneous cellular tissue is extremely developed, forming a thick reticular layer over the whole body. The internal cells are also of vast size, the right hepatic being 4½ inches long, the right abdominal 4½ by 4; the left abdominal 5½ by 4; the clavicular cell is not formed by a single cavity, but of numberless cellules, like those of the subcutaneous tissue. The heart *n* is triangular, pointed, 3 inches long, 2 inches and 10 twelfths in breadth; the aorta branches at the base, as in other birds, sending off the two trunks which separate into the subclavian and carotid. The lobes of the liver are extremely unequal, the right, *o*, being 4 inches in length, and 2¼ in breadth, while the left, *p*, is only 2 inches long, and 1¼ inches broad.

The mandibles are entirely covered with skin, of which the subcutaneous tissue is wanting, the cutis condensed, and the cuticle in large irregular longitudinal plates, leaving the surface somewhat rough and scaly. The crest-like excrescence on the ridge of the upper mandible is not formed of bone, nor otherwise connected with the osseous surface, which is smooth and continuous beneath it, than by being placed upon it, like any other part of the skin, and when softened by immersion in a liquid may be bent a little to either side. It is composed internally of erect slender plates of a fibrous texture, externally of horny fibres, which are erect on the sides, and longitudinal on the broadened ridge; these fibres being continuous with the cutis and cuticle. The skin of the mandible is continuous with that of the pouch, of which the structure is as follows: Externally there is a layer of cuticle, beneath which is the cutis, extremely thin, and with the cuticle thrown into longitudinal rugæ when contracted. The internal surface is also of cuticle, and beneath it is a layer of cutis. Between these two very thin layers of skin, is interposed an equally thin layer, composed of two sets of very slender muscular fibres, separated from each other, and running in two opposite directions. The outer fibres run in fasciculi from the lower and inner edge of the mandible; those from its base pass downwards, those arising more anteriorly pass gradually more forwards, and spreading out, reach the middle line of the pouch. The inner fibres have the same origin, and pass in a contrary direction, backwards and inwards. From the hyoid bone to the junction of the two crura of the mandible, which takes place almost at the very tip, there extends a thin band of longitudinal muscular fibres, in the centre of which is a cord of elastic tissue. By means of this apparatus, the sac is contracted, so as to occupy little space. When the bill is opened, the crura of the lower mandible separate from each other to a considerable extent, by the action of the muscles inserted into their base, this depending upon their

oblique position, and the sac is expanded. The upper mandible is capable of being moved to a considerable extent.

Below the anterior angle of the eye is a small sac about 5 twelfths of an inch in length, with an external aperture of 2 twelfths, and filled with a pulpy substance. The nostrils are linear, about 3 twelfths of an inch long, and quite concealed by the wrinkles of the skin. The aperture of the posterior nares 8 twelfths. The tongue is an extremely small, papilliform body, 3½ twelfths of an inch long, and 1 twelfth in diameter. The aperture of the glottis is linear, 8 twelfths in length, destitute of papillæ behind.

The pharynx is about 2½ inches in breadth. The œsophagus, *a*, at the commencement, or opposite the tongue, has a diameter of about 6 inches, and contracts until the middle of the neck, where it is 3 inches in width; at its entrance into the thorax at *b* it contracts to 1½ inches, but is dilatable to 3 inches; at this part, its inner coat is thrown into very prominent longitudinal rugæ. The structure of the œsophagus is similar to that of the Loon already described, but its muscular coat is much thinner. On entering the thorax, it again expands to a diameter of 3 inches. Its length from the glottis, exclusive of the proventriculus, is 2 feet. The proventriculus, *c d*, when not extended, has a diameter of 2 inches, its length being 4 inches and 8 twelfths. It is marked internally with six longitudinal broad ridges, about half an inch in breadth, and separated by grooves; and its cuticular lining is 1½ twelfths thick, of a compact but soft texture, elevated into tortuous reticulated ridges. The glandules, which are cylindrical, the largest 3 twelfths of an inch long, ½ twelfth in diameter, form a complete elongated belt. The muscular coat is also very thick, its inner layer composed of transverse, its outer of longitudinal fibres, and the greatest thickness of the walls of

the proventriculus is about 4½ twelfths of an inch. The stomach, *e*, properly so called, is extremely small, being of a roundish, compressed form, 1¼ inches in length, and of the same breadth; its muscular coat composed of slender fasciculi, and not presenting a distinction into lateral and inferior muscles, its inner coat smooth. Appended to it on the right side is a sac, *f*, of a roundish form, $1\frac{9}{12}$ inches in length, and 1½ in breadth, joining it by a contraction, of which the diameter is ½ inch, and opening directly into the proventriculus, as well as into the stomach; its walls thin, its inner surface smooth, with numerous mucous crypts irregularly disposed. The pylorus, *g*, is exceedingly small, 1½ twelfths in diameter, with a thickened margin.

The duodenum, *g*, *h*, *i*, passes backwards and upwards to the length of 6½ inches, returns upon itself enclosing the pancreas, receives the biliary ducts at the distance of 14 inches from the pylorus. The gall-bladder is oblong, 2 inches long, and 10 twelfths broad. The intestine then forms numerous convolutions, *j*, *k*, *l*, occupying the whole abdomen, and lying in part over the stomach and proventriculus. Its entire length is 10 feet 10 inches. Its diameter varies little, it being at the upper part 5 twelfths of an inch, towards the rectum 3½ twelfths. The rectum is 5½ inches long, including the cloaca, *m*, which is globular, and about 2½ inches in diameter. The cœca are 1 inch and 1 twelfth in length, 4 twelfths in diameter, cylindrical, rounded at the end. The muscular coat of the intestine is very strong, the inner villous.

One of the testes is 1 inch long, the other 1½; their form oblong. In the proventriculus and stomach is a vast accumulation of small lumbrici, about 1¼ inches in length, and amounting to about 1000.

The trachea is 1 foot 10 inches long, a little flattened, ½ inch in diameter throughout, but a little narrower about the middle; the rings 160, not ossified, excepting the lower. The contractor muscles are very small; as are the sterno-tracheal; and the inferior larynx is destitute of muscles. The bronchi are large, 5 twelfths in diameter, of 25 half rings.

The upper mandible is hollow in its whole extent; but the lateral spaces intervening between the edges of the median bone or ridge and the margins, are filled with a beautiful net-work of bony spiculæ. The two superior maxillary branches of the fifth pair of nerves, which are very large, being about 1 twelfth of an inch in diameter at the base, run close together along the median line, sending off branches at intervals, and extending to the end of the mandible. The lower mandible is also hollow, and similarly reticulated. The inferior maxillary branch, having entered on the inner side at the base, runs in like manner along its whole length, and is of the same thickness; by an aperture on the outer side near the base, it sends off a branch almost as thick, which runs within the membrane of the gular sac,

parallel to the mandible, and about half an inch distant from it, sending off branches at intervals. The sac is plentifully supplied with blood-vessels.

The nasal cavity is of an oblong form, 1 inch and 5 twelfths in length, passing obliquely backwards and upwards from the aperture of the posterior nares, and opening externally by curving forwards; its greatest diameter 5 twelfths, in its lower third 3 twelfths, and so continuing until it expands into the inferior slit-like aperture, which is 8 twelfths long. The cavity of the nose is thus small, and the olfactory nerve, which passes out from the anterior part of the brain, is a slender filament, about $\frac{1}{3}$ of a twelfth in diameter. It runs at first through a bony tube, then passes along the bony septum of the orbits, in contact for a short space with the superior maxillary nerve of the fifth pair, which at its commencement makes a great curve upwards, and crosses the orbit to enter the maxillary cavity, which has no communication with the olfactory. Fig. 2 represents the sternum viewed from before. It is remarkable chiefly for its great breadth and convexity. Its sides, *a*, *b*, *c*, *d*, are nearly parallel; its posterior margin broad, with two shallow notches, *e*, *f*, separated by a short conical obtuse median process. The crest or ridge, *h*, *i*, is carried forward in front, where it is only, however, of moderate height, and is not continued to the posterior extremity, but terminates at *i*, in the most convex part. The coracoid bones, *i*, *i*, are extremely large, very broad at their lower part, and having a deep groove and thin elongated process, *j*, at the upper for the tendon of the pectoralis medius,

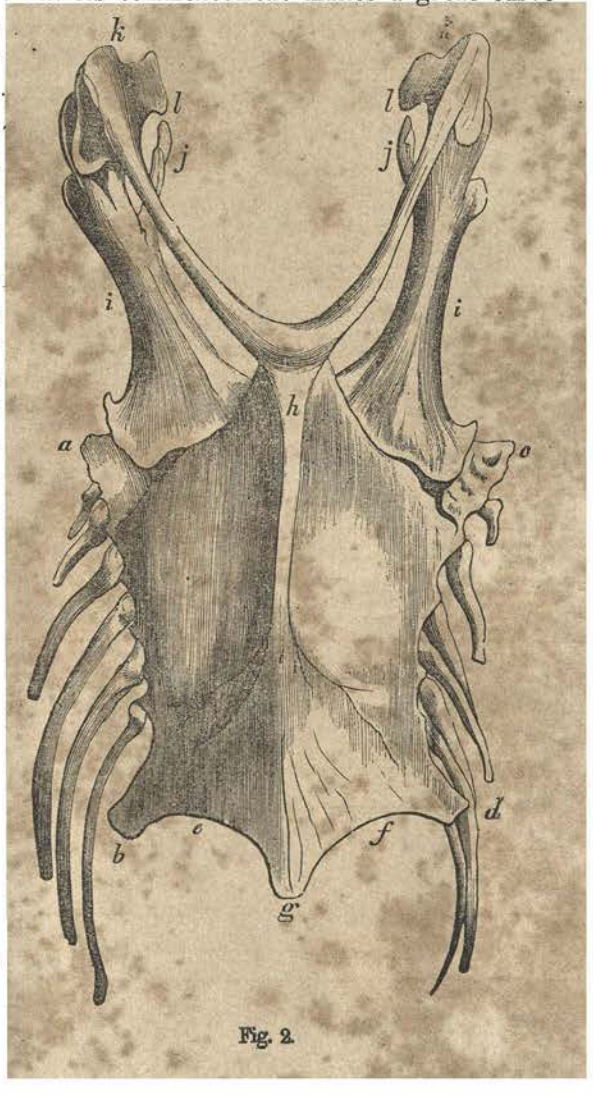


Fig. 2.

which raises the wing. The furcula, *k*, *k*, *l*, is anchylosed with the crest of the sternum, at *h*, has its crura moderately stout and much diverging, and its upper extremity very broad and recurvate. The scapula, of which only the anterior process, *l*, *l*, is seen, is small. A sternal apparatus like this indicates a steady and powerful flight, the wings being supported upon a very firm basis, and well separated. The great mass of the pectoral muscle being thrown forward, it acts more directly than in such birds as the Gallinæ and Ducks, in which it is placed farther backwards, and although its bulk is not so great as in them, it is more advantageously situated. The sternal apparatus of this Pelican is thus extremely similar to that of the Cormorant, and the American Anhinga, and is also constructed on the same plan as that of the Gannets, although in the latter its body is more elongated.

THE BROWN PELICAN.

PELECANUS FUSCUS, *Linn.*

PLATE CCCCXXIII.—MALE. PLATE CCCCXXIV.—YOUNG.

The Brown Pelican, which is one of the most interesting of our American birds, is a constant resident in the Floridas, where it resorts to the Keys and the salt-water inlets, but never enters fresh-water streams, as the White Pelican is wont to do. It is rarely seen farther eastward than Cape Hatteras, but is found to the south far beyond the limits of the United States. Within the recollection of persons still living, its numbers have been considerably reduced, so much indeed that in the inner Bay of Charleston, where twenty or thirty years ago it was quite abundant, very few individuals are now seen, and these chiefly during a continuance of tempestuous weather. There is a naked bar, a few miles distant from the main land, between Charleston and the mouth of the Santee, on which my friend JOHN BACHMAN some years ago saw a great number of these birds, of which he procured several; but at the present day, few are known to breed farther east than the salt-water inlets running parallel to the coast of Florida, forty or fifty miles south of St. Augustine, where I for the first time met with this Pelican in considerable numbers

Brown Pelican

Adult Male

Drawn from Nature by J.J. Audubon, F.R.S.F.L.S. Lith.ª Printed & Col.ª by J. T. Bowen. Phila.ª

Brown Pelican?

Young-first Winter.

Drawn from Nature by J.J.Audubon.F.R.S.F.L.S.

Lith.d Printed & Col.d by J. T. Bowen. Phila.a

My friend JOHN BULOW, Esq., took me in his barge to visit the Halifax, which is a large inlet, and on which we soon reached an island where the Brown Pelicans had bred for a number of years, but where, to my great disappointment, none were then to be seen. The next morning, being ten or twelve miles farther down the stream, we entered another inlet, where I saw several dozens of these birds perched on the mangroves, and apparently sound asleep. I shot at them from a very short distance, and with my first barrel brought two to the water, but although many of them still remained looking at us, I could not send the contents of my second barrel to them, as the shot had unluckily been introduced into it before the powder. They all flew off one after another, and still worse, as the servants approached those which had fallen upon the water, they also flew away.

On arriving at the Keys of Florida, on board the Marion Revenue Cutter, I found the Pelicans pretty numerous. They became more abundant the farther south we proceeded, and I procured specimens at different places, but nowhere so many as at Key West. There you would see them flying within pistol-shot of the wharfs, the boys frequently trying to knock them down with stones, although I believe they rarely succeed in their efforts. The Marion lay at anchor several days at a short distance from this island, and close to another. Scarcely an hour of daylight passed without our having Pelicans around us, all engaged at their ordinary occupations, some fishing, some slumbering as it were on the bosom of the ocean, or on the branches of the mangroves. This place and all around for about forty miles, seemed to be favourite resorts of these birds; and as I had excellent opportunities of observing their habits, I consider myself qualified to present you with some account of them.

The flight of the Brown Pelican, though to appearance heavy, is remarkably well sustained, that bird being able not only to remain many hours at a time on wing, but also to mount to a great height in the air to perform its beautiful evolutions. Their ordinary manner of proceeding, either when single or in flocks, is by easy flappings and sailings alternating at distances of from twenty to thirty yards, when they glide along with great speed. They move in an undulated line, passing at one time high, at another low, over the water or land, for they do not deviate from their course on coming upon a key or a point of land. When the waves run high, you may see them "troughing," as the sailors say, or directing their course along the hollows. While on wing they draw in their head between their shoulders, stretch out their broad webbed feet to their whole extent, and proceed in perfect silence.

When the weather is calm, and a flood of light and heat is poured down upon nature by the genial sun, they are often, especially during the love

season, seen rising in broad circles, flock after flock, until they attain a height of perhaps a mile, when they gracefully glide on constantly expanded wings, and course round each other, for an hour or more at a time, after which, in curious zigzags, and with remarkable velocity, they descend towards their beloved element, and settle on the water, on large sand-bars or on mangroves. It is interesting beyond description to observe flocks of Brown Pelicans thus going through their aërial evolutions.

Now, reader, look at these birds standing on their strong legs, on that burning sand-bar. How dexterously do they wield that great bill of theirs, as they trim their plumage! Now along each broad quill it passes, drawing it out and displaying its elasticity; and now with necks stretched to their full length, and heads elevated, they direct its point in search of the insects that are concealed along their necks and breasts. Now they drop their wings for awhile, or stretch them alternately to their full extent; some slowly lie down on the sand, others remain standing, quietly draw their head over their broad shoulders, raise one of their feet, and placing their bill on their back, compose themselves to rest. There let them repose in peace. Had they alighted on the waters, you might have seen them, like a fleet at anchor, riding on the ever-rolling billows as unconcernedly as if on shore. Had they perched on yon mangroves, they would have laid themselves flat on the branches, or spread their wings to the sun or the breeze, as Vultures are wont to do.

But see, the tide is advancing; the billows chase each other towards the shores; the mullets joyful and keen leap along the surface, as they fill the bays with their multitudes. The slumbers of the Pelicans are over; the drowsy birds shake their heads, stretch open their mandibles and pouch by way of yawning, expand their ample wings, and simultaneously soar away. Look at them as they fly over the bay; listen to the sound of the splash they make as they drive their open bills, like a pock-net, into the sea, to scoop up their prey; mark how they follow that shoal of porpoises, and snatch up the frightened fishes that strive to escape from them. Down they go, again and again. What voracious creatures they are!

The Brown Pelicans are as well aware of the time of each return of the tide, as the most watchful pilots. Though but a short time before they have been sound asleep, yet without bell or other warning, they suddenly open their eyelids, and all leave their roosts, the instant when the waters, which have themselves reposed for awhile, resume their motion. The Pelicans possess a knowledge beyond this, and in a degree much surpassing that of man with reference to the same subject: they can judge with certainty of the changes of weather. Should you see them fishing all together, in retired bays, be assured, that a storm will burst forth that day; but if they pursue

their finny prey far out at sea, the weather will be fine, and you also may launch your bark and go to the fishing. Indeed, most sea-birds possess the same kind of knowledge, as I have assured myself by repeated observation, in a degree corresponding to their necessities; and the best of all prognosticators of the weather, are the Wild Goose, the Gannet, the Lestris, and the Pelican.

This species procures its food on wing, and in a manner quite different from that of the White Pelican. A flock will leave their resting place, proceed over the waters in search of fish, and when a shoal is perceived, separate at once, when each, from an elevation of from fifteen to twenty-five feet, plunges in an oblique and somewhat winding direction, spreading to the full stretch its lower mandible and pouch, as it reaches the water, and suddenly scoops up the object of its pursuit, immersing the head and neck, and sometimes the body, for an instant. It immediately swallows its prey, rises on wing, dashes on another fish, seizes and devours it, and thus continues, sometimes plunging eight or ten times in a few minutes, and always with unerring aim. When gorged, it rests on the water for awhile, but if it has a brood, or a mate sitting on her eggs, it flies off at once towards them, no matter how heavily laden it may be. The generally received idea that Pelicans keep fish or water in their pouch, to convey them to their young, is quite erroneous. The water which enters the pouch when it is immersed, is immediately forced out between the partially closed mandibles, and the fish, unless larger than those on which they usually feed, is instantly swallowed, to be afterwards disgorged for the benefit of the young, either partially macerated, or whole, according to the age and size of the latter. Of all this I have satisfied myself, when within less than twenty yards of the birds as they were fishing; and I never saw them fly without the pouch being closely contracted towards the lower mandible. Indeed, although I now much regret that I did not make the experiment when I had the means of doing so, I doubt very much if a Pelican could fly at all with its burden so much out of trim, as a sailor would say.

They at times follow the porpoise, when that animal is in pursuit of prey, and as the fishes rise from the deep water towards the surface, come in cunningly for their share, falling upon the frightened shoal, and seizing one or more, which they instantly gobble up. But one of the most curious traits of the Pelican is, that it acts unwittingly as a sort of purveyor to the Gulls just as the Porpoise acts towards itself. The Black-headed Gull of WILSON, which is abundant along the coast of the Floridas in spring and summer, watches the motions of the Pelicans. The latter having plunged after a shoal of small fishes, of which it has caught a number at a time, in letting off the water from amongst them, sometimes allows a few to escape; but the

Gull at that instant alights on the bill of the Pelican, or on its head, and seizes the fry at the moment they were perhaps congratulating themselves on their escape. This every body on board the Marion observed as well as myself, while that vessel was at anchor in the beautiful harbour of Key West. To me such sights were always highly interesting, and I doubt if in the course of my endeavours to amuse you, I ever felt greater pleasure than I do at this moment, when, with my journal at my side, and the Gulls and Pelicans in my mind's eye as distinctly as I could wish, I ponder on the faculties which Nature has bestowed on animals which we merely consider as possessed of instinct. How little do we yet know of the operations of the Divine Power! On the occasions just mentioned, the Pelicans did not manifest the least anger towards the Gulls.

On the ground this species is by no means so active, for it walks heavily, and when running, which it now and then does while in play, or during courtship, it looks extremely awkward, as it then stretches out its neck, partially extends its wings, and reels so that one might imagine it ready to fall at each step. If approached when wounded and on the water, it swims off with speed, and when overtaken, it suddenly turns about, opens its large bill, snaps it violently several times in succession, causing it to emit a smart noise in the manner of owls, strikes at you, and bites very severely. While I was at Mr. BULOW'S, his Negro hunter waded after one whose wing had been broken. The Pelican could not be seized without danger, and I was surprised to see the hunter draw his butcher's knife, strike the long blade through the open pouch of the bird, hook it, as it were, by the lower mandible, and at one jerk swing it up into the air with extreme dexterity, after which he broke its neck and dragged it ashore.

The pouch measures from six to ten inches in depth, according to the age of the bird after the first moult. The superb male whose portrait is before you, and which was selected from among a great number, had it about the last mentioned size, and capable of holding a gallon of water, were the mandibles kept horizontal. This membrane is dried and used for keeping snuff, gunpowder and shot. When fresh it may be extended so as to become quite thin and transparent, like a bladder.

This Pelican seldom seizes fish that are longer than its bill, and the size of those on which it ordinarily feeds is much smaller. Indeed, several which I examined, had in the stomach upwards of a hundred fishes, which were only from two to three inches in length. That organ is long, slender, and rather fleshy. In some I found a great number of live blue-coloured worms, measuring two and a half inches in length, and about the thickness of a Crow-quill. The gut is about the size of a Swan's quill, and from ten to twelve feet in length, according to the age of the individual.

At all periods the Brown Pelican keeps in flocks, seldom amounting to more than fifty or sixty individuals of both sexes, and of different ages. At the approach of the pairing time, or about the middle of April, the old males and females separate from the rest, and remove to the inner keys or to large estuaries, well furnished with mangroves of goodly size. The young birds, which are more numerous, remain along the shores of the open sea, unless during heavy gales.

Now let us watch the full grown birds. Some skirmishes have taken place, and the stronger males, by dint of loud snappings of their bill, some hard tugs of the neck and head, and some heavy beats with their wings, have driven away the weaker, which content themselves with less prized belles. The females, although quiet and gentle on ordinary occasions, are more courageous than the males, who, however, are assiduous in their attentions, assist in forming the nest, feed their mates while sitting, and even share the labour of incubation with them. Now see the mated birds, like the citizens of a newly laid out town in some part of our western country, breaking the dry sticks from the trees, and conveying them in their bills to yon mangrove isle. You see they place all their mansions on the south-west side, as if to enjoy the benefit of all the heat of that sultry climate. Myriads of mosquitoes buzz around them, and alight on the naked parts of their body, but this seems to give them no concern. Stick after stick is laid, one crossing another, until a strong platform is constructed. Now roots and withered plants are brought, with which a basin is formed for the eggs. *Not* a nest, you observe, is placed very low; the birds prefer the tops of the mangroves, although they do not care how many nests are on one tree, or how near the trees are to each other. The eggs, of which there are never more three, are rather elliptical, and average three inches and one-eighth in length, by two inches and one-eighth in their greatest breadth. The shell is thick and rather rough, of a pure white colour, with a few faint streaks of a rosy tint, and blotches of a very pale hue, from the centre towards the crown of the egg.

The young are at first covered with cream-coloured down, and have the bill and feet disproportionately large. They are fed with great care, and so abundantly, that the refuse of their food, putrid and disgusting, lies in great quantities round them; but neither young nor old regard this, however offensive it may be to you. As the former grow the latter bring larger fish to them. At first the food is dropped in a well macerated state into their extended throats; afterwards the fish is given to them entire; and finally the parent birds merely place it on the edge of the nest. The young increase in size at a surprising rate. When half fledged they seem a mere mass of fat, their partially indurated bill has acquired considerable length, their

wings droop by their sides, and they would be utterly unable to walk. The Vultures at this period often fall upon them and devour them in the absence of their parents. The Indians also carry them off in considerable numbers; and farther eastward, on the Halifax river, for instance, the Negroes kill all they can find, to make gumbo soup of them during winter. The Crows, less powerful, but quite as cunning, suck the eggs; and many a young one which has accidentally fallen from the nest, is sure to be picked up by some quadruped, or devoured by the Shark or Balacuda. When extensive depredations have thus been made, the birds abandon their breeding places, and do not return to them. The Pelicans in fact are, year after year, retiring from the vicinity of man, and although they afford but very unsavoury food at any period of their lives, will yet be hunted beyond the range of civilization, just as our best of all game, the Wild Turkey, is now, until to meet with them the student of nature will have to sail round Terra del Fuego, while he may be obliged to travel to the Rocky Mountains before he can find the other bird. Should you approach a settlement of the Pelicans and fire a few shots at them, they all abandon the place, and leave their eggs or young entirely at your disposal.

At all seasons, the Negroes of the plantations on the eastern coast of the Floridas lie in wait for the Pelicans. There, observe that fellow, who, with rusty musket, containing a tremendous charge of heavy shot, is concealed among the palmettos, on the brink of a kind of embankment formed by the shelly sand. Now comes a flock of Pelicans, forcing their way against the breeze, unaware of the danger into which they rush, for there, a few yards apart, several Negroes crouch in readiness to fire; and let me tell you, good shots they are. Now a blast forces the birds along the shore; off goes the first gun, and down comes a Pelican; shot succeeds shot; and now the Negroes run up to gather the spoil. They skin the birds like so many racoons, cut off the head, wings, and feet; and should you come this way next year, you may find these remains bleached in the sun. Towards night, the sable hunters carry off their booty, marching along in Indian file, and filling the air with their extemporaneous songs. At home they perhaps salt, or perhaps smoke them; but in whatever way the Pelicans are prepared, they are esteemed good food by the sons of Africa.

The Brown Pelican is a strong and tough bird, although not so weighty as the white species. Its flesh is, in my opinion, always impure. It seems never satisfied with food, and it mutes so profusely, that not a spot of verdure can be seen on the originally glossy and deep-colored mangroves on which it nestles; and I must say that, much as I admire it in some respects, I should be sorry to keep it near me as a pet.

During winter, when the mullet, a favourite fish with the Brown Pelican,

as it is with me, retires into deeper water, these birds advance farther to seaward, and may be seen over all parts of the Gulf of Mexico, and between the Florida Reefs and the opposite isles, especially during fine weather. They are very sensible to cold, and in this respect are tender birds. Now and then, at the season, they are seen on Lake Borgne and over Lake Pontchartrain, but never on the Mississippi beyond the rise of the tides, the space higher up being abandoned to the White Pelican. The keenness of their sight is probably equal to that of any Hawk, and their hearing is also very acute. They are extremely silent birds, but when excited they utter a loud and rough grunt, which is far from musical. Several persons in the Floridas assured me that the Brown Pelicans breed at all seasons of the year ; but as I observed nothing to countenance such an idea, I would give it as my opinion that they raise only one brood in the season.

Their bodies are greatly inflated by large air-cells ; their bones, though strong, are very light ; and they are tough to kill.

Since I wrote my account of the habits of this very interesting bird, I have followed it westward as far as the inland bays of the Texas, where I found it almost as abundant as on the coast of the Floridas. In the former country, however, I observed it breeding on the ground, and on the small naked islets of the large bays margining the Mexican Gulf. The nests were formed much in the same manner as when placed on trees, and the eggs were of the same number as stated. Having examined several specimens procured on the nest, in the act of incubation, I found that the plumage of the fully adult female is precisely like that of the male ; and I am now convinced that birds of both sexes are several years in acquiring their full plumage, although the precise number of years is what I have not yet learned. Some additional observations respecting the habits of this species may now be stated.

During a severe gale, on the 7th of April, 1836, the wind coming from the north-west, I saw a flock of about thirty of these birds flying only a few feet above the water, and against the gale. Having proceeded a few yards, they plunged into the water, generally to leeward, and threw their bodies round as soon as their bills were immersed, giving a very curious appearance to the wings, which seemed as if locked. On seizing a fish they kept the bill beneath the surface for a short time in a perpendicular direction, and drew it up gradually, when the water was seen to flow out, after which they raised the bill to an horizontal position, and swallowed the fish. In this way the whole flock kept dashing and plunging pell-mell, like Gannets, over a space of about one hundred yards, fishing at times in the very surf, and where the water could not be more than a very few feet deep. Each of them must have caught upwards of a score of fishes. As soon as they were

satisfied, they flew in a line across the channel, and landed on low banks under the lee of the island, opposite our harbour. During all the time of their fishing they were attended by a number of Black-headed Gulls, *Larus Atricilla*, which followed all their movements, alighting on their heads, and feeding as I have already described. These Gulls followed their purveyors to some low banks to spend the night.

Notwithstanding all that has been said to the contrary by some European writers, I feel perfectly satisfied that these Pelicans must make ample use of some oily matter contained in the uropygial gland, as their plumage is always dry in the midst of their continued plungings. On the 14th of the same month, my party happened to shoot a good number of Brown Pelicans, among which was one slightly wounded in the body. The sailors tied its bill with a piece of rope-yarn, and placed it in the stern of the boat; but while they were again charging their muskets, the bird recovered sufficiently to take to its wings, clear the boat, and fly off. In such a condition it must necessarily have perished of hunger.

PELECANUS FUSCUS, Bonap. Syn., p. 401.
BROWN PELICAN, Nutt. Man., vol. ii. p. 476.
BROWN PELICAN, *Pelecanus fuscus*, Aud. Orn. Biog., vol. iii. p. 376; vol. v. p. 212.

Adult, 52, 80.

Very abundant and constantly resident from Texas along the shores eastward to North Carolina. Breeds on trees and also on the ground; eggs three.

Adult Male.

Bill more than twice the length of the head, rather stout, straight, depressed towards the end. Upper mandible with the dorsal line straight as far as the unguis, the ridge broad and convex, separated from the side by a groove on each side, broader and more convex at the base, narrowed and flattened towards the unguis, which is curved, stout, convex above, sharp-edged, acute; sides of the bill perpendicular at the base, narrowed towards the middle, widened and approaching to horizontal towards the end; edges sharp, with a broad furrowed groove beneath for the reception of those of the lower mandible. Lower mandible with the angle extending to less than half an inch from the tip, and filled by a bare membrane, the sides nearly erect and convex, the edges sharp, the tip compressed, deflected, obtuse. The membrane of the lower mandible extends down the fore neck in the form of a wrinkled pouch.

Head of moderate size, oblong; neck long, stout; body rather slender. Feet short, stout, nearly central; tibia bare, its lower part covered all round with small scales; tarsus short, stout, compressed, covered all round with

hexagonal scales, of which the anterior are much larger; toes in the same plane, all connected by reticulated webs, the first shortest, the third and fourth nearly equal, reticulate at the base, scutellate along the rest of the upper surface, claws short, strong, curved, rather acute, that of hind toe with a sharp pectinate inner edge.

Feathers of the head and neck exceedingly small and slender, of the fore part of the head stiff, hair-like and glossy; of the upper middle part of the neck behind a little larger and soft, forming a slight longitudinal crest; of the sides and hind part of the neck soft and downy. The feathers of the upper parts in general are remarkably small, narrow, tapering to a point; of the lower part of the neck stiff and pointed, of the breast and sides somewhat larger than those above, and softer. Wings long, rounded; primaries much curved, with strong square shafts; the second longest, the third very little shorter, the first a little longer than the fifth, secondaries very numerous, rather small, rounded, the inner longer and more tapering. Tail short, slightly rounded, of twenty-two feathers.

Bill greyish-white, tinged with brown, and marked with irregular spots of pale carmine; upper mandible dusky towards the end, lower blackish from the middle to near the end. Bare space between the bill and the eye deep blue; eyelids pink; iris white. Feet black. The gular pouch is greenish-black, the ridges of its wrinkles lighter. The hair-like feathers on the fore part of the head light yellow, the rest of the head white; a stripe of the same margining the pouch to the middle of the neck, and extending a little beyond, a short space between these two lines anteriorly, and the whole of the posterior and lateral parts of the neck of a dark chestnut-brown, the small crest paler. The back and wings are dusky, each feather with the central part greyish-white; the latter colour prevails on the scapulars and larger wing-coverts. Primaries and their coverts brownish-black, secondaries greyish-brown, their outer edges greyish-white; tail light grey; the shafts of the quills and tail-feathers are white in their basal half, black towards the end. The lower parts are brownish-grey; the sides of the neck and body with narrow longitudinal white lines. On the fore neck, below the dark chestnut spot is a smaller pale yellow mark, behind which the feathers for a short space are blackish-brown.

Length to end of tail 52 inches, to end of wings 52, to end of claws 53¼; extent of wings 80; bill along the ridge 13¼, along the edge of lower mandible 14½; depth of gular pouch 10, its extent along the neck 13; wing from flexure 24; tail 7; tarsus 2½; middle toe 3$\frac{11}{12}$, its claw $\frac{9}{12}$. Weight 6 lbs. 4½ oz.

The Female, which is considerably larger, resembles the male in colour, only that the neck is yellowish-white in its whole extent, without any

brown, and its feathers are stiff and not downy as in the male. Weight 7 lbs. 12 oz.

Young.

Bill greyish-blue, its edges and unguis greyish-yellow; gular pouch dull greyish-blue. Iris brownish-yellow; bare space around the eye of a dusky bluish tint, the feathers margining it yellowish-white. The feathers of the head and neck are less downy than in the adult, and those on the sides of the latter less elongated or pointed. The head and neck are dark brown, as are the upper parts generally; the secondary and many of the smaller coverts margined with pale brown; the primaries and their coverts as well as the tail-coverts brownish-black, with white shafts. Feet and claws dull leaden colour.

In an adult female preserved in spirits the general peculiarities of the organization are the same as those described in the American White Pelican.

The Mangrove.

Rhizophora Mangle, *Linn.*, Syst. Nat., vol. ii. p. 325.

The species of *mangrove* represented in the plate is very abundant along the coast of Florida and on almost all the Keys, excepting the Tortugas. Those islands which are named Wet Keys are entirely formed of mangroves, which, raising their crooked and slender stems from a bed of mud, continue to increase until their roots and pendent branches afford shelter to the accumulating debris, when the earth is gradually raised above the surface of the water. No sooner has this taken place than the mangroves in the central part of the island begin to decay, and in the course of time there is only an outer fringe or fence of trees, while the interior becomes overgrown with grass and low bushes. Meantime the mangroves extend towards the sea, their hanging branches taking root wherever they come in contact with the bottom, and their seeds also springing up. I am at a loss for an object with which to compare these trees, in order to afford you an idea of them; yet if you will figure to yourself a tree reversed, and standing on its summit, you may obtain a tolerable notion of their figure and mode of growth. The stem, roots and branches are very tough and stubborn, and in some places the trees are so intertwined that a person might find it as easy to crawl over them as to make his way between them. They are evergreen, and their tops afford a place of resort to various species of birds at all seasons, while their roots and submersed branches give shelter to numberless testaceous mollusca and small fishes. The species represented is rarely observed on the coast of

Florida of a greater height than twenty-five or thirty feet, and its average height is not above fifteen feet. The *land mangrove*, of which I have seen only a few, the finest of which were on Key West, is a tall tree, much larger and better shaped than the other, with narrower leaves and shorter fruits.

Genus V.—SULA, *Briss.* GANNET.

Bill longer than the head, opening beyond the eyes, straight, elongated, conical, moderately compressed; upper mandible with the dorsal line straight and declinate, at the end convex and a little decurved; the ridge very broad, convex, with a slight median carina, and separated on each side from the sides, which are perpendicular, slightly convex, and have an additional narrow-jointed piece below the eye; edges sharp, direct, irregularly serrate, with numerous slender cuts directed backwards, tip compressed, a little decurved, rather acute; lower mandible with the angle extremely long and narrow, the dorsal line straight, ascending, the sides erect, convex, the edges sharp and serrated, the tip compressed, acute. No external nostrils. Head large, neck of moderate length, and very thick; body of moderate bulk, rather elongated. Feet short, strong, placed rather far behind; tibiæ concealed; tarsus very short, rounded before, sharp behind, scaly, with three lines of small transversely oblong scutella, which run down the toes, the latter long and slender, all united by membranes having their margins straight; first toe rather small, directed inwards and forwards; middle toe longest, the outer almost equal. Claws of moderate size, slightly arched, that of the third toe pectinate. Plumage generally close, rather compact, on the head and neck blended. Wings very long, narrow, acute; first quill longest. Tail rather long, cuneate, of twelve or fourteen feathers. Gular sac small, with a small median portion bare; tongue extremely small, blunt; œsophagus extremely wide; proventricular glands forming a broad belt partially divided by intervals; stomach extremely small, its muscular coat thin, the inner soft; intestine of moderate length, slender; cœca very small; cloaca globular.

COMMON GANNET.

SULA BASSANA, *Linn.*

PLATE CCCCXXV.—ADULT MALE AND YOUNG.

On the morning of the 14th of June, 1833, the white sails of the Ripley were spread before a propitious breeze, and onward she might be seen gaily wending her way toward the shores of Labrador. We had well explored the Magdalene Islands, and were anxious to visit the Great Gannet Rock, where, according to our pilot, the birds from which it derives its name breed. For several days I had observed numerous files proceeding northward, and marked their mode of flight while thus travelling. As our bark dashed through the heaving billows, my anxiety to reach the desired spot increased. At length, about ten o'clock, we discerned at a distance a white speck, which our pilot assured us was the celebrated rock of our wishes. After awhile I could distinctly see its top from the deck, and thought that it was still covered with snow several feet deep. As we approached it, I imagined that the atmosphere around was filled with flakes, but on my turning to the pilot, who smiled at my simplicity, I was assured that nothing was in sight but the Gannets and their island home. I rubbed my eyes, took up my glass, and saw that the strange dimness of the air before us was caused by the innumerable birds, whose white bodies and black-tipped pinions produced a blended tint of light grey. When we had advanced to within half a mile, this magnificent veil of floating Gannets was easily seen, now shooting upwards, as if intent on reaching the sky, then descending as if to join the feathered masses below, and again diverging toward either side and sweeping over the surface of the ocean. The Ripley now partially furled her sails, and lay to, when all on board were eager to scale the abrupt sides of the mountain isle, and satify their curiosity.

Judge, reader, of our disappointment. The weather, which hitherto had been beautiful, suddenly changed, and we were assailed by a fearful storm. However, the whale-boat was hoisted over, and manned by four sturdy "down-easters," along with THOMAS LINCOLN and my son. I remained on board the Ripley, and commenced my distant observations, which I shall relate in due time.

An hour has elapsed; the boat, which had been hid from our sight, is now

Common Gannet

Drawn from Nature by J.J. Audubon F.R.S.F.L.S.

1. Adult male. 2. Young.

Lith.ª Printed & Col.ª by J. T. Bowen, Phila.ª

in view; the waves run high, and all around looks dismal. See what exertions the rowers make; it blows a hurricane, and each successive billow seems destined to overwhelm their fragile bark. My anxiety is intense, as you may imagine; in the midst of my friends and the crew I watch every movement of the boat, now balanced on the very crest of a rolling and foaming wave, now sunk far into the deep trough. We see how eagerly yet calmly they pull. My son stands erect, steering with a long oar, and LINCOLN is bailing the water which is gaining on him, for the spray ever and anon dashes over the bow. But they draw near, a rope is thrown and caught, the whale-boat is hauled close under our lee-board; in a moment more all are safe on deck, the helm round, the schooner to, and away under bare poles she scuds toward Labrador.

THOMAS LINCOLN and my son were much exhausted, and the sailors required a double allowance of grog. A quantity of eggs of various kinds, and several birds, had been procured, for wherever sufficient room for a Gannet's nest was not afforded on the rock, one or two Guillemots occupied the spot, and on the ledges below, the Kittiwakes lay thick like snow-flakes. The discharging of their guns produced no other effect than to cause the birds killed or severely wounded to fall into the water, for the cries of the countless multitudes drowned every other noise. The party had their clothes smeared with the nauseous excrements of hundreds of Gannets and other birds, which in shooting off from their nests caused numerous eggs to fall, of which some were procured entire. The confusion on and around the rock was represented as baffling all description; and as we gazed on the mass now gradually fading on our sight, we all judged it well worth the while to cross the ocean to see such a sight. But yet it was in some measure a painful sight to me, for I had not been able to land on this great breeding-place, of which, however, I here present a description given by our pilot Mr. GODWIN.

"The top of the main rock is a quarter of a mile wide, from north to south, but narrower in the other direction. Its elevation is estimated at about four hundred feet. It stands in lat. 47° 52′. The surf beats its base with great violence, unless after a long calm, and it is extremely difficult to land upon it, and still more so to ascend to the top or platform. The only point on which a boat may be landed lies on the south side, and the moment the boat strikes it must be hauled dry on the rocks. The whole surface of the upper platform is closely covered with nests, placed about two feet asunder, and in such regular order that a person may see between the lines, which run north and south, as if looking along the furrows of a deeply ploughed field. The Labrador fishermen and others who annually visit this extraordinary resort of the Gannets, for the purpose of procuring their flesh to bait

their cod-fish hooks, ascend armed with heavy short clubs, in parties of eight, ten, or more, and at once begin their work of destruction. At sight of these unwelcome intruders, the affrighted birds rise on wing with a noise like thunder, and fly off in such a hurried and confused manner as to impede each other's progress, by which thousands are forced downwards, and accumulate into a bank many feet high; the men beating and killing them with their clubs until fatigued, or satisfied with the number they have slain." Here Mr. GODWIN assured us that he had visited the Gannet Rock ten seasons in succession, for the purpose just mentioned, and added, that on one of these occasions, "six men had destroyed five hundred and forty Gannets in about an hour, after which the party rested awhile, and until most of the living birds had left their immediate neighbourhood, for all around them, beyond the distance of about a hundred yards, thousands of Gannets were yet sitting on their nests, and the air was filled with multitudes of others. The dead birds are now roughly skinned, and the flesh of the breast cut up in pieces of different sizes, which will keep good for bait about a fortnight or three weeks. So great is the destruction of these birds for the purpose mentioned, that the quantity of their flesh so procured supplies with bait upwards of forty boats, which lie fishing close to the Island of Brion each season. By the 20th of May the rock is covered with birds on their nests and eggs, and about a month afterwards the young are hatched. The earth is scratched by the birds for a few inches deep, and the edges surrounded by sea-weeds and other rubbish, to the height of eight or ten inches, tolerably well matted together. Each female Gannet lays a single egg, which is pure white, but not larger than a good-sized hen's egg. When the young are hatched, they are bluish-black, and for a fortnight or more their skin is not unlike that of the common dog-fish. They gradually become downy and white, and when five or six weeks old look like great lumps of carded wool."

I was well pleased with this plain statement of our pilot, as I had with my glass observed the regularity of the lines of nests, and seen many of the birds digging the earth with their strong bills, while hundreds of them were carrying quantities of that long sea-weed called *eel-grass*, which they seem to bring from towards the Magdalene Islands. While the Ripley lay to near the rock, thousands of the Gannets constantly flew over our heads; and although I shot at and brought several to the water, neither the reports nor the sight of their dead companions seemed to make any impression on them.

On weighing several of the Gannets brought on board, I found them to average rather more than seven pounds; but Mr. GODWIN assured me that when the young birds are almost ready to fly, they weigh eight and sometimes nine pounds. This I afterwards ascertained to be true, and I account for the difference exhibited at this period by the young birds, by the great

profusion of food with which their parents supply them, regardless in a great measure of their own wants. The pilot further told me that the stench on the summit of the rock was insupportable, covered as it is during the breeding season, and after the first visits of the fishermen, with the remains of carcasses of old and young birds, broken and rotten eggs, excrements, and multitudes of fishes. He added that the Gannets, although cowardly birds, at times stand and await the approach of a man, with open bill, and strike furious and dangerous blows. Let me now, reader, assure you that unless you had seen the sight witnessed by my party and myself that day, you could not form a correct idea of the impression it has to this moment left on my mind.

The extent of the southward migration of the Gannet, after it has reared its young, is far greater perhaps than has hitherto been supposed. I have frequently seen it on the Gulf of Mexico, in the latter part of autumn and in winter; and a few were met with, in the course of my last expedition, as far as the entrance of the Sabine river into the Gulf. Being entirely a maritime species, it never proceeds inland, unless forced by violent gales, which have produced a few such instances in Nova Scotia and the State of Maine, as well as the Floridas, where I saw one that had been found dead in the woods two days after a furious hurricane. The greater number of the birds of this species seen in these warm latitudes during winter are young of that or the preceding year. My friend JOHN BACHMAN has informed me that during one of his visits to the Sea Islands off the shores of South Carolina, on the 2nd of July, 1836, he observed a flock of Gannets of from fifty to a hundred, all of the colouring of the one in my plate, and which was a bird in its first winter plumage. They were seen during several days on and about Cole's Island, at times on the sands, at others among the rolling breakers. He also mentions having heard Mr. GILES, an acquaintance of his, who knows much about birds, say, that in the course of the preceding summer he had seen a pair of Gannets going to, and returning from, a nest in a tree! This is in accordance with the report of Captain NAPOLEON COSTE, who commanded the United States revenue cutter Campbell, placed at my disposal during my visit to Texas, and who was lieutenant as well as pilot of the Marion. He stated that he had found a breeding place on the coast of Georgia, occupied by a flock of old, and therefore White Gannets, the nests of all of which were placed upon trees. No one can be greatly surprised at these reports, who knows, as I do, that the Brown Gannet, *Sula fusca*, breeds both on trees and on dry elevated sand-bars. During winter months I have generally observed single birds at some considerable distance from the shore out at sea. sometimes indeed bevond what mariners call

soundings, but rarely young ones, they generally keeping much nearer to the shores, and procuring their food in shallower water.

The flight of the Gannet is powerful, well sustained, and at times extremely elegant. While travelling, whether in fine or foul weather, they fly low over the surface of the water, flapping their wings thirty or forty times in succession, in the manner of the Ibis and the Brown Pelican, and then sailing about an equal distance, with the wings at right angles to the body, and the neck extended forwards. But, reader, to judge of the elegance of this bird while on wing, I would advise you to gaze on it from the deck of any of our packet ships, when her commander has first communicated the joyful news that you are less than three hundred miles from the nearest shore, whether it be that of merry England or of my own beloved country. You would then see the powerful fisher, on well-spread pinions, and high over the water, glide silently along, surveying each swelling wave below, and coursing with so much ease and buoyancy as to tempt you to think that had you been furnished with equal powers of flight, you might perform a journey of eighty or ninety miles without the slightest fatigue in a single hour. But perhaps at the very moment when these thoughts have crossed your mind, as they many times have crossed mine on such occasions, they are suddenly checked by the action of the bird, which, intent on filling its empty stomach, and heedless of your fancies, plunges headlong through the air, with the speed of a meteor, and instantaneously snatches the fish which its keen sight had discovered from on high. Now perchance you may see the snow-white bird sit buoyantly for awhile on the bosom of its beloved element, either munching its prey, or swallowing it at once. Or perhaps, if disappointed in its attempt, you will see it rise by continued flappings, shaking its tail sideways the while, and snugly covering its broad webbed feet among the under coverts of that useful rudder, after which it proceeds in a straight course, until its wings being well supplied by the flowing air, it gradually ascends to its former height, and commences its search anew.

In severe windy weather, I have seen the Gannet propelling itself against the gale by sweeps of considerable extent, placing its body almost sideways or obliquely, and thus alternately, in the manner of Petrels and Guillemots; and I have thought that the bird then moved with more velocity than at any other time, except when plunging after its prey. Persons who have seen it while engaged in procuring food, must, like myself, have been surprised when they have read in books that Gannets "are never known to dive," and yet are assured that they "have been taken by a fish fastened to a board sunk to the depth of two fathoms, in which case the neck has either been found dislocated, or the bill firmly fixed in the wood." With such statements

before him, one might think that his own vision had been defective, had he not been careful to note down at once the result of his observations. And as this is a matter of habit with me, I will offer you mine, good reader, not caring one jot for what has been said to you before on the subject.

I have seen the Gannet plunge, and afterwards remain under the surface of the water for at least one minute at a time. On one occasion of this kind, I shot one just as it emerged, and which held a fish firmly in its bill, and had two others half-way down its throat. This has induced me to believe that it sometimes follows its prey in the water, and seizes several fishes in succession. At other times I have observed the Gannet plunge amidst a shoal of launces so as scarcely to enter the water, and afterwards follow them, swimming, or as it were running, on the water, with its wings extended upwards, and striking to the right and left until it was satiated. While on the Gulf of Mexico, I wounded a Gannet, which, on falling to the water, swam so fast before the boat, that we rowed about a quarter of a mile before we reached it, when it suddenly turned towards us, opened its bill, as if intent on defending itself, but was killed with the stroke of an oar by one of the sailors. When shot at without even being touched, these birds often disgorge their food in the manner of Vultures; and this they always do when wounded, if their stomach and gullet happen to be full. Sometimes, after being wounded in the wings, they will float and allow you to take them, without making any attempt to escape. Nay, my young friend, GEORGE C. SHATTUCK, M. D., of Boston, while with me at Labrador, caught one which he found walking amongst a great number of Guillemots, on a low and rocky island.

When they are on their favourite breeding rocks, and about to fly, they elevate their head, throw it backward, open the bill, and emit a loud prolonged cry, before launching themselves into the air, in doing which they waddle a few paces with their wings partially extended. After starting, their first motion is greatly inclined downwards, but they presently recover, and seem to support themselves with ease. When they are twenty or thirty yards off, you observe them shaking the tail sideways, and then hiding their feet among the under coverts of the tail. At other times they suddenly open their feet, moving them as if for the purpose of grasping some object below, in the same manner as some Hawks, but only for a few moments, when again the tail is shaken, and the feet hidden as before. They beat their wings and sail alternately, even when flying around their breeding places.

On the ground the movements of the Gannet are exceedingly awkward, and it marches with hampered steps, assisting itself with the wings, or keeping them partially open, to prevent its falling. Their walk, indeed, is

merely a hobble. When the sun shines, they are fond of opening their wings and beating them in the manner of Cormorants, shaking the head meanwhile rather violently, and emitting their usual uncouth guttural notes of *cara, karew, karow.* You may well imagine the effect of a concert performed by all the Gannets congregated for the purpose of breeding on such a rock as that in the Gulf of St. Lawrence, where, amidst the uproar produced by the repetition of these notes, you now and then distinguish the loud and continued wolfish howling-like sounds of those about to fly off.

The newly-finished nest of this bird is fully two feet high, and quite as broad externally. It is composed of seaweeds and maritime grasses, the former being at times brought from considerable distances. Thus, the Gannets breeding on the rocks in the Gulf of St. Lawrence, carry weeds from the Magdalene Islands, which are about thirty miles distant. The grasses are pulled or dug up from the surface of the breeding place itself, often in great clods consisting of roots and earth, and leaving holes not unlike the entrances to the burrows of the Puffin. The nests, like those of Cormorants, are enlarged or repaired annually. The single egg, of a rather elongated oval form, averages three inches and one-twelfth in length, by two inches in its greatest breadth, and is covered with an irregular roughish coating of white calcareous matter, which, on being scraped off, leaves exposed the pale greenish-blue tint of the under layer.

The birds usually reach the rock when already paired, in files often of hundreds, and are soon seen billing in the manner of Cormorants, and copulating on the rocks, but never, like the birds just mentioned, on the water, as some have supposed. The period of their arrival at their breeding grounds appears to depend much on the latitude of the place; for, on the Bass Rock, in the Firth of Forth, which I had the pleasure of visiting in the agreeable company of my learned friend WILLIAM MACGILLIVRAY and his son, on the 19th of August, 1825, the Gannets are first seen in February, whereas in the Gulf of St. Lawrence they rarely reach the Great Rock until the middle of April or beginning of May; and at Chateau Beau in the Straits of Belle Isle, not until a fortnight or three weeks later. Like the members of most large communities, the Gannets, though so truly gregarious at this season, shew a considerable degree of animosity towards their more immediate neighbours as soon as incubation commences. A lazy bird perhaps, finding it easier to rob the nest of its friend of weeds and sods, than to convey them from some distant place, seizes some, on which the other resents the injury, and some well-directed thrusts of their strong bills are made, in open day and in full view of the assembled sitters, who rarely fail to look on with interest, and pass the news from one to another, until all are apprized of the quarrel. The time however passes on. The patient mother, to lend more

warmth to her only egg, plucks a few of the feathers from some distance beneath her breast. In sunny weather, she expands those of her upper parts, and passing her bill along their roots, destroys the vile insects that lurk there. Should a boisterous gale or a thick cold fog mar the beauty of the day, she gathers her apparel around her, and shrinks deeper into her bed; and should it rain, she places her body so as to prevent the inundation of her household. How happy, reader, must she be when now and then her keen eyes distinguish in the crowd her affectionate mate, as he returns from the chase, with loaded bill, and has already marked her among the thousand beauties all equally anxious for the arrival of their lords! Now by her side he alights as gently as is in his nature, presents her with a welcome repast, talks perhaps cheeringly to her, and again opening his broad wings departs in search of a shoal of herrings. At length, the oval chest opens, and out crawls the tender young; but lo! the little thing is black. What a strange contrast to the almost pure white of the parent! Yet the mother loves it, with all the tenderness of other mothers. She has anxiously expected its appearance, and at once she nurses it with care; but so tender is it that she prefers waiting awhile before she feeds it. The time however soon comes, and with exceeding care she provides some well macerated morsels which she drops into its open mouth; so well prepared are they that there is no instance on record of a Gannet, even of that tender age, having suffered from dyspepsia or indigestion.

The male Gannet assists in incubating, though he sits less assiduously than the female; and, on such occasions, the free bird supplies the other with food. The sight of the young Gannet just after birth might not please the eye of many, for it is then quite naked, and of a deep bluish-black, much resembling a young Cormorant. Its abdomen is extremely large, its neck thin, its head large, its eyes as yet sightless, its wings but slightly developed. When we look at it three weeks afterwards, it has grown much, and almost entirely changed its colour, for, now, with the exception of certain parts of the neck, the short thighs, and the belly, it is covered with yellowish soft and thick down. In this state it looks perhaps as uncouth as at first, but it grows so rapidly that at the end of three weeks more, you find its downy coat patched with feathers in the most picturesque manner imaginable. Looking around you, you observe that all the young are not of the same growth; for all the Gannets do not lay on the same day, and probably all the young are not equally supplied with food. At this period, the great eyrie looks as if all its parts had become common property; the nests, which were once well fashioned, are trampled down; the young birds stand everywhere or anywhere; lazy-looking creatures they are, and with an appearance of nonchalance which I have never observed in any other species of bird, and

which would lead you to think that they care as little about the present as the future. Now the old birds are freed of part of their cares, they drop such fish as they have obtained by the side of their young, and, like Cormorants, Pelicans, or Herons, seldom bring a supply oftener than once a-day. Strange to say, the young birds at this period do not appear to pay the least attention to the old ones, which occasionally alight near them, and drop fish for them to feed upon.

Gannets do not feed, as some have supposed, and as many have believed, on herring only; for I have found in their stomachs codlings eight inches in length, as well as very large American mackerels, which, by the way, are quite different from those so abundantly met with on the coasts of Europe.

The young never leave the spot on which they have been reared until they are well able to fly, when they separate from the old birds, and do not rejoin them until at least a year after. Although I have in a few instances found individuals yet patched with dark grey spots, and with most of their primary quills still black, I am confident that it is not until the end of two years that they acquire their full plumage. I have seen some with one wing almost pure black, and the tail of that colour also; others with the tail only black; and several with pure black feathers interspersed among the general white plumage.

I know of no other bird that has so few formidable enemies as the Gannet. Not one of the species of Lestris with which I am acquainted ever attempts to molest it; and, although I have seen the Frigate Pelican in quest of food within a short distance of it, I never saw it offer injury. The insular rocks on which it breeds are of course inaccessible to quadrupeds. The only animals, so far as I know, that feed on the eggs or young, are the *Larus marinus* and *Larus glaucus*. It is said that the Skua, *Lestris Catarractes*, sometimes pursues the Gannets, but that species does not exist in North America; and I am inclined to doubt the truth of this statement, for I have never seen a Lestris of any kind attack a bird equal to itself in size and strength.

Soon after the young Gannets are able to fly, all the birds of the species leave the breeding place, and absent themselves until the following season. While at Newfoundland, I was told that the English and French fishermen who inhabit that country salt young Gannets for winter provision, as is done in Scotland; but I saw none there. In my estimation, the flesh of this bird is so bad that, as long as any other can be procured, it ought to be rejected.

It is a curious fact, that the Gannets often procure mackerels or herrings four or five weeks before the fishermen fall in with them on our coast; but this is easily explained by their extensive wanderings. Although this bird is easily kept in captivity, it is far from being a pleasant pet. Its ordure is

abundant, disagreeable to the eye as well as the nose; its gait is awkward; and even its pale owl-like eyes glare on you with an unpleasant expression. Add to this, the expense of its food, and I can easily conceive that you will not give it a place in your aviary, unless for the mere amusement of seeing it catch the food thrown to it, which it does like a dog.

The feathers of the lower parts of the Gannet differ from those of most other birds, in being extremely convex externally, which gives the bird the appearance of being covered beneath with light shell-work, exceedingly difficult to be represented in a drawing.

SULA BASSANA, Bonap. Syn., p. 408.
GANNET, *Sula bassana*, Nutt. Man., vol. ii. p. 495.
COMMON GANNET, *Sula bassana*, Aud. Orn. Biog., vol. iv. p. 222.

Adult, 40½, 75. Young fledged, 38, 72.

Ranges southward off the coast at all seasons as far as the Gulf of Mexico. Breeds on rocks on the Gulf of St. Lawrence, and off the coast of Labrador. Abundant. Migratory.

Adult Male.

Bill longer than the head, opening beyond the eyes, straight, elongated-conical, moderately compressed. Upper mandible with the dorsal line straight and declinate, at the end convex and a little decurved; ridge very broad, convex, with a slight median carina, and separated on each side, from the sides, which are nearly perpendicular, slightly convex, and have an additional narrow jointed piece below the eye; edges sharp, direct, irregularly serrate, with numerous slender cuts directed backwards; tip compressed, a little decurved, rather acute. No external nostrils. Lower mandible with the angle very long and narrow, the dorsal line straight, ascending, the sides erect, convex, the edges sharp and serrated, the tip compressed and sharp.

Head large; neck of moderate length and very thick, body of moderate bulk, rather elongated; wings long. Feet short, strong, placed rather far behind; tibiæ concealed; tarsus very short, rounded before, sharp behind, at its upper part anteriorly with rather large roundish-flat scales, in the rest of its extent with very small oblong tubercles; anteriorly there are three lines of small transversely oblong scutella, which run down the toes. The latter are long and slender, all united by membranes, which are reticularly granulated, and have their margins straight; first toe rather small, directed inwards and forwards, middle toe longest, the outer almost equal. Claws of moderate size, slightly arched, those of the first and middle toes depressed, the latter with its inner edge thin and pectinated.

Plumage generally close, rather compact, the feathers small and rounded: those on the head and neck blended and slightly glossed. A bare space

between the bill and the eye, surrounding the latter, and extending an inch behind the angle of the mouth. The gular membrane also bare for a small breadth, extending two inches beyond the base of the mandible. About a quarter of an inch of the tibia bare. Wings very long, narrow, acute; primaries strong, narrow, tapering rapidly at a rounded point; first longest, second about a quarter of an inch shorter, the rest rapidly graduated; secondaries short, rather broad, rounded, with a minute acumen. Tail rather long, cuneate, of twelve narrow tapering feathers.

Bill pale bluish-grey, tinged with green towards the base; the lines on the upper mandible blackish-blue; the bare space about the eye, and that on the throat, blackish-blue. Iris white. Tarsi, toes, and webs, brownish-black, the bands of narrow scutella on the tarsus and toes light greenish-blue; claws greyish-white. The general colour of the plumage is white; the upper part of the head and the hind neck of a fine buff-colour. Primary quills brownish-black, their shafts white toward the base.

Length to end of tail 40½ inches, to end of wings 38¼, to end of claws 41; extent of wings 75; wing from flexure 20¾; tail 10; bill along the ridge 4, along the edge of lower mandible 6; tarsus 2$\frac{3}{12}$; first toe and claw 1¼; middle toe 3$\frac{8}{12}$, its claw $\frac{7}{12}$; outer toe 3$\frac{6}{12}$; its claw $\frac{4}{12}$. Weight 7 lbs.

The female is similar to the male, but rather smaller

Young fully fledged.

Bill light greyish-brown; the bare space around the eye pale greyish-blue. Iris green. Feet dusky, the narrow bands of scutella pale greyish-blue; claws greyish-white. The head, neck, and upper parts are chocolate-brown, each feather with a terminal narrow triangular white spot; the lower parts greyish-white, spotted with greyish-brown; each feather having a broad terminal margin of that colour. The quills and tail-feathers are brownish-black. An individual shot in October measured as follows:—

Length to end of tail 38 inches, to end of claws 32½; extent of wings 72. Weight 3 lbs. 4 oz. This individual, however, was very poor.

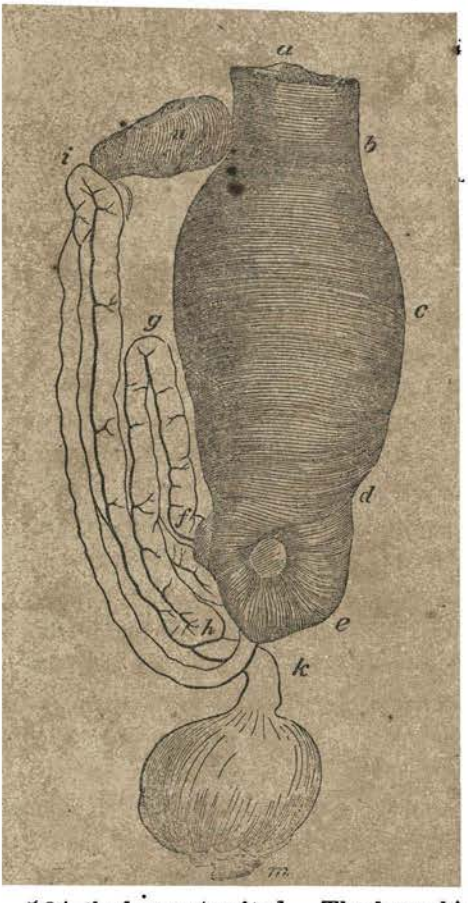
Three individuals shot in the neighbourhood of Boston, Massachusetts, presented the following dimensions, which are here given as indicative of the difference of size frequently observed:—

Length to end of tail, . .	38¾	38¾	37
. . . . . wings, . .	37½	37½	35
. . . . . claws, . .	34¼	34½	33
Extent of wings, . . .	73½	72	68½
Wing from flexure, . . .	19½	17½	19½

An adult Male killed near Boston. The cellular tissue of the back exhibits vacuities of very large size, intervening between the skin and the muscles: one, at the lower part of the neck behind, being 5 inches in length;

another 5½ inches long, extending from the furcula down the humerus; and behind the wings four others, extending to the last rib. Branches from these pass between the muscles, which present the appearance of having been as it were dissected. A cell of enormous size covers the side of the abdomen, and another pair run down the middle of it, separated by a partition in the median line. That part of the cellular tissue which adheres to the bases of the feathers is also remarkably loose; and, close to each of them, is a roundish aperture of large size, communicating with the great cavities mentioned above. Between the pectoralis major and the subjacent muscles is a large interspace formed by a great cell. The internal thoracic and abdominal cells are also very large.

On the roof of the mouth are five sharp ridges. The nasal aperture is 1 inch and 5 twelfths long, linear, with a soft longitudinal flap on each side. The tongue is extremely small, being only 7 twelfths long, 1 twelfth broad, blunt at the extremity, and with two papillæ at the base. The bare skin between the crura of the mandibles is of the same structure as that of the Pelicans and Cormorants, but of small extent, its posterior acute extremity not extending farther than that at the base of the bill. The aperture of the glottis is 7½ twelfths long. The thyroid bone has an anterior curved prolongation, which projects forwards, and from the extremity of which comes the elastic ligament by which it is connected with the hyoid bone. The œsophagus, *a*, *b*, is 15 inches long, measured to the commencement of the proventriculus, extremely dilated, its diameter 2½ inches at the top, contracting to 2 inches as it enters the thorax, its narrowest part 1 inch 4 twelfths; its transverse muscular fibres moderately strong. The proventriculus, *c*, *d*, is excessively large, 3½ inches long, its greatest diameter 2¾ inches. The glandules are cylindrical, 3 twelfths long, forming a very broad belt, separated however at its narrowest part by a longitudinal interval of 5 twelfths of an inch, and having three partial divisions on its lower edge. The greatest length of the proventriculus, or breadth of the belt of glandules, is 2½ inches. The mucous coat of the œsophagus is smooth, but thrown into longitudinal plicæ when contracted; that of the proventriculus is continuous, and of the same nature, being marked with extremely minute reticulated lines, of which the more prominent have a longitudinal direction. The stomach, properly so called, *d e*, is extremely small, being only 1 inch 9 twelfths long, and about the same breadth. Its inner coat is similar to that of the œsophagus and proventriculus, being destitute of epithelium; several large mucous crypts are scattered over its surface. The pylorus is small, having a diameter of nearly 3 twelfths, and a marginal flap or valve on one side. The intestine, *f*, *g*, *h*, is of moderate length, measuring 53 inches. The duodenum *at first passes upwards* in the direction of the liver for 2



inches, *f g*, is then recurved for 3 inches, *g*, *h*, ascends for 4 inches, *h*, *i*, and receives the biliary ducts, then passes toward the spine and forms a curvature. The average diameter of the intestine is 5 twelfths at the upper part, and it gradually contracts to 3 twelfths. The rectum, *k*, measured to the anus, is 5¼ inches. It gradually enlarges from 4 to 6½ twelfths. The cloaca, *m*, is globular, 9 twelfths long, 8 twelfths broad. The cœca are 3 twelfths long, 1½ twelfths broad.

The lobes of the liver are extremely unequal, as is always the case when the stomach or the proventriculus is excessively large, the right lobe being 2⅝ inches long, the left 1 inch and 8 twelfths. The gall-bladder, *n*, is very large, of an oblong form, rounded at both ends, 1 inch and 8 twelfths long.

The trachea is 12 inches long, moderately ossified, round, its diameter at the top 7 twelfths, gradually narrowing to 4 twelfths; the rings 124, the lower 4 united. The bronchi are large, their diameter greater than that of the lower part of the trachea; of 25 cartilaginous half-rings. The lateral or contractor muscles of the trachea are of moderate strength; the sterno-tracheals strong; a pair of inferior laryngeal muscles attached to the glandular-looking, yellowish-white bodies inserted upon the membrane between the first and second rings of the bronchi.

The olfactory nerve comes off from the extreme anterior point of the cerebrum, enters a canal in the spongy tissue of the bone, and runs in it close to the septum between the eyes for 10 twelfths of an inch, with a slight curve. It then enters the nasal cavity, which is of an irregular triangular form, 1½ inches long at the external or palatal aperture, 10 twelfths in height. The supramaxillary branch of the fifth pair runs along the upper edge of the orbit, and by a canal in the spongy tissue of the bones, enters the great cavity of the upper mandible, keeping nearer its lower surface, and their branches. This cavity appears to have no communication with the nasal; nor has the latter any passage towards the obliterated external nostrils.

Booby Gannet.

Male.

Drawn from Nature by J.J.Audubon, F.R.S.F.L.S. Lith.ª Printed & Col.ª by J. T. Bowen, Philad.ª

The lachrymal duct passes obliquely inwards from the anterior corner of the eye, and enters the nasal cavity by an aperture ½ twelfth in diameter, near its anterior margin.

In the cloaca was found a solid calculus, half an inch in diameter, of an irregular form, white within, externally pale yellowish-brown, and marked with grooves impressed by the action of the sphincter ani.

The digestive and respiratory organs of the American Gannet are thus precisely similar to those of the European. In external form, proportions, and colours, there are no appreciable differences. The young in all stages are similar. The flight, voice, general habits, and all other circumstances, are the same. What, then, shall we say to those who have pretended that the American bird differs from the European? Merely this, compare the two, outside and inside, shew us differences, and then we shall judge if they be sufficient to indicate different species; but until you have done this, do not imagine that a mere "*Sula Americana* Nob.," is enough to satisfy the world on this or any similar point.

THE BOOBY GANNET.

SULA FUSCA, *Linn.*

PLATE CCCCXXVI.—MALE.

As the Marion was nearing the curious islets of the Tortugas, one of the birds that more particularly attracted my notice was of this species. The nearer we approached the land, the more numerous did they become, and I felt delighted with the hope that ere many days should elapse, I should have an opportunity of studying their habits. As night drew her sombre curtain over the face of nature, some of these birds alighted on the top-yard of our bark, and I observed ever afterwards that they manifested a propensity to roost at as great a height as possible above the surrounding objects, making choice of the tops of bushes, or even upright poles, and disputing with each other the privilege. The first that was shot at, was approached with considerable difficulty: it had alighted on the prong of a tree which had floated and been fastened to the bottom of a rocky shallow at some distance from

shore; the water was about four feet deep and quite rough; sharks we well knew were abundant around us; but the desire to procure the bird was too strong to be overcome by such obstacles. In an instant, the pilot and myself were over the sides of the boat, and onward we proceeded with our guns cocked and ready. The yawl was well manned, and its crew awaiting the result. After we had struggled through the turbulent waters about a hundred yards, my companion raised his gun and fired; but away flew the bird with a broken leg, and we saw no more of it that day. Next day, however, at the same hour, the Booby was seen perched on the same prong, where, after resting about three hours, it made off to the open sea, doubtless in search of food.

About eight miles to the north-east of the Tortugas lighthouse, lies a small sand-bar a few acres in extent, called Booby Island, on account of the number of birds of this species that resort to it during the breeding-season, and to it we accordingly went. We found it not more than a few feet above the surface of the water, but covered with Boobies, which lay basking in the sunshine, and pluming themselves. Our attempt to land on the island before the birds should fly off, proved futile, for before we were within fifty yards of it, they had all betaken themselves to flight, and were dispersing in various directions. We landed, however, distributed ourselves in different parts, and sent the boat to some distance, the pilot assuring us that the birds would return. And so it happened. As they approached, we laid ourselves as flat as possible in the sand, and although none of them alighted, we attained our object, for in a couple of hours we procured thirty individuals of both sexes and of different ages, finding little difficulty in bringing them down as they flew over us at a moderate height. The wounded birds that fell on the ground made immediately for the water, moving with more ease than I had expected from the accounts usually given of the awkward motions of these birds on the land. Those which reached the water swam off with great buoyancy, and with such rapidity, that it took much rowing to secure some of them, while most of those that fell directly into the sea with only a wing broken, escaped. The island was covered with their dung, the odour of which extended to a considerable distance leeward. In the evening of the same day we landed on another island, named after the Noddy, and thickly covered with bushes and low trees, to which thousands of that species of Tern resort for the purpose of breeding. There also we found a great number of Boobies. They were perched on the top branches of the trees, on which they had nests, and here again we obtained as many as we desired. They flew close over our heads, eyeing us with dismay but in silence; indeed, not one of these birds ever emitted a cry, except at the moment when they rose from their perches or from the sand. Their note

is harsh and guttural, somewhat like that of a strangled pig, and resembling the syllables *hork, hork.*

The nest of the Booby is placed on the top of a bush at a height of from four to ten feet. It is large and flat, formed of a few dry sticks, covered and matted with sea-weeds in great quantity. I have no doubt that they return to the same nest many years in succession, and repair it as occasion requires. In all the nests which I examined, only one egg was found, and as most of the birds were sitting, and some of the eggs had the chick nearly ready for exclusion, it is probable that these birds raise only a single young one, like the Common Gannet or Solan Goose. The egg is of a dull white colour, without spots, and about the size of that of a common hen, but more elongated, being $2\frac{3}{8}$ inches in length, with a diameter of $1\frac{3}{4}$. In some nests they were covered with filth from the parent bird, in the manner of the Florida Cormorant. The young, which had an uncouth appearance, were covered with down; the bill and feet of a deep livid blue or indigo colour. On being touched, they emitted no cry, but turned away their heads at every trial. A great quantity of fish lay beneath the trees in a state of putrefaction, proving how abundantly the young birds were supplied by their parents. Indeed, while we were on Noddy Island, there was a constant succession of birds coming in from the sea with food for their young, consisting chiefly of flying-fish and small mullets, which they disgorged in a half macerated state into the open throats of their offspring. Unfortunately the time afforded me on that coast was not sufficient to enable me to trace the progress of their growth. I observed, however, that none of the birds which were still brown had nests, and that they roosted apart, particularly on Booby Island, where also many barren ones usually resorted, to lie on the sand and bask in the sun.

The flight of the Booby is graceful and extremely protracted. They pass swiftly at a height of from twenty yards to a foot or two from the surface, often following the troughs of the waves to a considerable distance, their wings extended at right angles to the body; then, without any apparent effort, raising themselves and allowing the rolling waters to break beneath them, when they tack about, and sweep along in a contrary direction in search of food, much in the manner of the true Petrels. Now, if you follow an individual, you see that it suddenly stops short, plunges headlong into the water, pierces with its powerful beak and secures a fish, emerges again with inconceivable ease, after a short interval rises on wing, performs a few wide circlings, and makes off toward some shore. At this time its flight is different, being performed by flappings for twenty or thirty paces, with alternate sailings of more than double that space. When overloaded with food,

they alight on the water, where, if undisturbed, they appear to remain for hours at a time, probably until digestion has afforded them relief.

The range to which this species confines itself along our coast, seldom extends beyond Cape Hatteras to the eastward, but they become more and more numerous the farther south we proceed. They breed abundantly on all such islands or keys as are adapted for the purpose, on the southern and western coasts of the Floridas and in the Gulf of Mexico, where I was told they breed on the sand-bars. Their power of wing seems sufficient to enable them to brave the tempest, while during a continuance of fair weather they venture to a great distance seaward, and I have seen them fully 200 miles from land.

The expansibility of the gullet of this species enables it to swallow fishes of considerable size, and on such occasions their mouth seems to spread to an unusual width. In the throats of several individuals that were shot as they were returning to their nests, I found mullets measuring seven or eight inches, that must have weighed fully half a pound. Their body, beneath the skin, is covered with numerous air-cells, which probably assist them in raising or lowering themselves while on wing, and perhaps still more so when on the point of performing the rapid plunge by which they secure their prey.

Their principal enemies during the breeding-season are the American Crow and the Fish Crow, both of which destroy their eggs, and the Turkey Buzzard, which devours their young while yet unfledged. They breed during the month of May, but I have not been able to ascertain if they raise more than one brood in the season. The adult birds chase away those which are yet immature during the period of incubation. It would seem that they take several years in attaining their perfect state.

When procured alive, they feed freely, and may be kept any length of time, provided they are supplied with fish. No other food, however, could I tempt them to swallow, excepting slices of turtle, which after all they did not seem to relish. In no instance did I observe one drinking. Some authors have stated that the Frigate Pelican and the Lestris force the Booby to disgorge its food that they may obtain it; but this I have never witnessed. Like the Common Gannet, they may be secured by fastening a fish to a soft plank, and sinking it a few feet beneath the surface of the water, for if they perceive the bait, which they are likely to do if they pass over it, they plunge headlong upon it, and drive their bill into the wood.

When a Booby has alighted on the spar of a vessel, it is no easy matter to catch it, unless it is much fatigued; but if exhausted and asleep, an expert seaman may occasionally secure one. I was informed that after the breeding-season, these birds roost on trees in company with the Brown Pelican

and a species of Tern, *Sterna stolida*, and spend their hours of daily rest on the sand-banks. Our pilot, who was a man of great observation, assured me that while at Vera Cruz, he saw the fishermen there go to sea, and return from considerable distances, simply by following the course of the Boobies.

The bills and legs of those which I procured in the brown plumage, and which were from one to two years of age, were dusky-blue. These were undergoing moult on the 14th of May. At a more advanced age, the parts mentioned become paler, and when the bird has arrived at maturity, are as represented in my plate. I observed no external difference between the sexes in the adult birds. The stomach is a long dilatable pouch, thin, and of a yellow colour. The body is muscular, and the flesh, which is of a dark colour, tough, and having a disagreeable smell, is scarcely fit for food.

I am unable to find a good reason for those who have chosen to call these birds *boobies*. Authors, it is true, generally represent them as extremely *stupid ;* but to me the word is utterly inapplicable to any bird with which I am acquainted. The Woodcock, too, is said to be stupid, as are many other birds ; but my opinion, founded on pretty extensive observation, is, that it is only when birds of any species are unacquainted with man, that they manifest that kind of *ignorance* or *innocence* which he calls *stupidity*, and by which they suffer themselves to be imposed upon. A little acquaintance with him soon enables them to perceive enough of his character to induce them to keep aloof. This I observed in the Booby Gannet, as well as in the Noddy Tern, and in certain species of land birds of which I have already spoken. After my first visit to Booby Island in the Tortugas, the Gannets had already become very shy and wary, and before the Marion sailed away from those peaceful retreats of the wandering sea-birds, the *Boobies* had become so knowing, that the most expert of our party could not get within shot of them.

SULA FUSCA, Bonap. Syn., p. 408.
BOOBY, *Sula fusca*, Nutt. Man., vol. ii. p. 500.
BOOBY GANNET, *Sula fusca*, Aud. Orn. Biog., vol. iii. p. 63.

Male, 31, 49¼.

Gulf of Mexico, and as far east as the coast of Georgia. Breeds on the Tortugas Keys, south of Florida. Abundant. Migratory.

Adult Male.

Bill longer than the head, opening beyond the eyes, straight, elongated-conical, broader above than beneath at the base, compressed. Upper mandible with the dorsal line convex at the base, then a little concave, and towards the tip slightly arched, ridge very broad, convex, separated by a seam on each side from the sides, which are nearly perpendicular, edges

sharp, inflected, serrated, tip acute. No external nostrils. Lower mandible prolonged at the base behind the upper, its angle very long, wide at the base, with a bare membrane, very narrow towards the end, dorsal line straight, ascending, sides convex, tip very acute, edges serrated towards the end.

Head rather large; neck rather long and thick; body of moderate bulk, rather elongated; wings long. Feet short, strong, placed rather far behind; tibiæ concealed; tarsus very short, rounded before, sharp behind, covered all round with reticular scales; toes all united by membranes; first very short, being about half the length of the second, third and fourth longest and nearly equal, but the claw of the third is much longer than that of the fourth; claws small, compressed, acute, curved, that of the third toe largest, depressed, curved outwards, with a thin pectinated inner edge.

Plumage generally short, close, rather compact, the feathers small and rounded; those on the head very small; loral and orbital spaces bare, as is that in the angle of the lower mandible, and a short space above the tibio-tarsal joint; wings long, acute, narrow; primaries strong, narrow, tapering rapidly to a rounded point, first and second longest and about equal, the rest rapidly graduated; secondaries short, rather broad, narrowed towards the rounded point. Tail rather long, cuneate, of twelve narrow, tapering feathers.

Bill and naked parts at its base bright yellow, pale flesh-coloured towards the end; a dusky spot before the eye. Iris white. Tarsi, toes, and their connecting webs, pale yellow, claws white. Head, neck all round, upper parts in general, and lower surface of wings, dusky-brown, tinged with grey; the breast, abdomen, and lower tail-coverts, pure white.

Length 31 inches, to end of claws 27, extent of wings 29¼; bill along the back 3$\frac{11}{12}$, along the edge 5; tarsus 1$\frac{5}{12}$, middle toe and claw 3½. Wing from flexure 16½, tail 8½. Weight 3 lbs. 4½ oz.

The Female resembles the male, but is smaller.

The Young, when fledged, are of a greyish-brown colour all over, the breast and abdomen being merely a little lighter than the rest. The bill and claws are dusky, the tarsi and toes with their membranes dull yellow.

Genus VI.—PHAETON, *Linn.* TROPIC BIRD.

Bill as long as the head, stout, very much compressed, slightly curved, tapering, acute, opening to beneath the eye; upper mandible with the dorsal line slightly arched, the ridge narrow, rounded, the sides sloping and slightly convex at the base, nearly erect towards the end, the edges sharp, direct, irregularly broken, the tip acuminate; nasal groove short, near the ridge; lower mandible with the angle long, and extremely narrow, the dorsal line straight and ascending, the sides erect and slightly convex, the tip acuminate. Nostrils basal, linear, very small. Head rather large, ovate; neck short and thick; body rather full. Feet very short; tibia bare for a considerable space; tarsus extremely short, roundish, covered with small round scales; toes rather small, placed in the same plane, and connected by reticulated webs; first very small, third a little longer than fourth, all scutellate above. Claws small, arched, compressed, rather sharp, that of the third toe with a thin entire inner edge. Plumage soft, blended, on the back rather compact. Wings long, acute, the first quill longest. Tail of twelve feathers, tapering, the two middle feathers extremely elongated, narrow, and tapering. This genus appears to be intermediate between Sula and Sterna.

THE TROPIC BIRD

PHAETON ÆTHEREUS, *Linn.*

PLATE CCCCXXVII.—ADULT MALE AND FEMALE.

The specimens from which the figures in the plate were taken, were obtained on the Tortugas, in the summer of 1832, by my kind friend ROBERT DAY, Esq., of the United States revenue cutter Marion. They were shot out of a flock of eight or ten, and were in fine condition. I have represented the male and female, in what I suppose to be their full summer or breeding plumage; but not having had an opportunity of studying the habits of this remarkable bird, I am unable to give any information respecting them.

PHAETON ÆTHEREUS, Bonap. Syn., p. 409.
TROPIC BIRD, Nutt. Man., vol. ii. p. 503.
TROPIC BIRD, *Phaeton æthereus*, Aud. Orn. Biog., vol. iii. p. 442.

Male, 29½, 38. Female, 26, 34.
Rare on the coast of Florida. Migratory.
Adult Male in summer.

Bill as long as the head, stout, very much compressed, slightly curved, tapering, acute. Upper mandible with the dorsal line slightly arched, the ridge narrow, but rounded, the sides sloping and slightly convex at the base, nearly perpendicular towards the end, the edges sharp, irregularly broken, the tip acute. Nasal groove short, near the ridge; nostrils linear, very small. Lower mandible with the angle of moderate length, extremely narrow, the dorsal line straight and ascending, the sides erect and slightly convex, the edges sharp but irregularly serrated, the tip very acute.

Head rather large, ovate. Neck short and thick. Body rather full. Feet very short; tibia bare for a considerable space; tarsus extremely short, roundish, covered all round with small round scales; toes rather small, placed in the same plane, and connected by reticulated webs; the first toe very small, the third and fourth about equal, all scutellate above. Claws small, arched, compressed, rather sharp, that of middle toe largest, with an undulated thin inner edge.

Plumage soft, blended, on the back and wings rather compact. Wings

Tropic Bird

1 Male 2 Female

Drawn from Nature by J.J.Audubon.F.R.S.F.L.S.

Lith.d Printed & Col.d by J. T. Bowen, Phila.a

long, acute ; primaries strong, tapering, the first longest, the rest rapidly graduated ; secondaries very short, incurved, rounded, the inner longer. Tail of twelve feathers, wedge-shaped, the two middle feathers extremely elongated, narrow, and tapering.

Bill orange-red. Iris brown. Tarsi and base of toes yellow, the rest and the webs black, as are the claws. The general colour of the plumage is pale pink, or white tinged with carmine, the two middle tail feathers redder. A curved spot before the eye, and band behind it, black. A band of the same colour extends across the wing from the flexure, running narrow along the middle coverts, much enlarged on the inner secondaries and their coverts, and including the extremities of the scapulars. The outer webs, shafts, and a portion of the inner webs of the first four primary quills, are also black, and there is a spot of the same on some of the primary coverts. The shafts of the two middle tail feathers are black, excepting towards the end ; and some of the long hypochondrical feathers are greyish-black in the centre.

Length to end of tail 29½ inches, to end of wings 16, to end of claw 14 ; extent of wings 38 ; wing from flexure 11¼ ; tail 19⅛ ; bill along the ridge 2, along the edge of lower mandible 2⅜ ; tarsus 1$\frac{9}{12}$; middle toe 1$\frac{4}{12}$, its claw $\frac{4}{12}$. Weight 15 oz.

Adult Female.

The female resembles the male, but is less tinged with red. The bill is yellow, the iris and feet as in the male. The tail-feathers are also less elongated.

Length to end of tail 26 inches, to end of wings 14¼, to end of claws 13 ; wing from flexure 11 ; tail 16 ; extent of wings 34 ; bill along the ridge $\frac{11}{12}$, along the edge of lower mandible 2½ ; tarsus $\frac{9}{12}$; middle toe 1$\frac{4}{12}$, its claw $\frac{4}{12}$. Weight 12 oz.

FAMILY XLII.—LARINÆ. GULLS.

Bill of moderate length, straight, compressed, acute; upper mandible with the dorsal line generally straight until toward the end, when it is decurved, the ridge convex, the nasal groove rather long, the edges sharp, direct, overlapping, the tip rather acute and declinate; lower mandible with the angle long and very narrow, the dorsal line ascending and nearly straight, with an angular prominence at its commencement. Nostrils submedial or basal, oblong. Head of moderate size, ovate; neck of moderate length; body rather stout. Legs short or of moderate length; tibia bare at its lower part; tarsus anteriorly scutellate; toes four, the first very small, free, the third longest; anterior toes connected by webs. Claws small, arched, compressed, rather acute. Plumage full, soft, blended, somewhat compact on the back and wings, the latter long and pointed; tail of twelve feathers, even, rounded, or emarginate. Tongue long, slender, pointed; œsophagus very wide; stomach rather small, moderately muscular, with a dense, longitudinally rugous epithelium; intestine of moderate length and width; cœca small; cloaca globular. Trachea simple, with a single pair of inferior laryngeal muscles. Nest on the ground, rudely constructed. Eggs few, not exceeding four, spotted. Young covered with down.

Genus I.—RHYNCHOPS, *Linn.* SKIMMER.

Bill longer than the head, nearly straight, tetragonal at the base, suddenly extremely compressed and continuing so to the end; upper mandible much shorter than the lower, its ridge sharp, the sides erect but a little convex, the edges approximated so as to leave merely a very narrow groove between them, the tip a little rounded, when viewed laterally; nasal groove rather short, near the margin; lower mandible with the angle extremely short, the dorsal line straight or slightly decurved, the sides erect, obliquely grooved, the edges united into a very thin blade, which fits into the narrow groove of the upper mandible, the tip rounded or abrupt, when viewed laterally. Nostrils linear-oblong. Head rather large, oblong, considerably elevated in

W.H.

Black Skimmer or Shearwater.

front; neck rather short, thick; body short, ovate. Feet short, moderately stout; tibia bare below, with narrow transverse scutella before and behind; tarsus short, anteriorly covered with broad scutella; toes very small, the first extremely short and free, unless at the base; middle toe slightly longer than outer; anterior toes united by deeply emarginate webs. Claws long, compressed, slightly arched, rather obtuse. Plumage moderately full, soft, and blended; wings extremely long, and very narrow; primary quills excessively long, the first longest; secondaries short. Tail of moderate length, deeply forked, of twelve feathers. Tongue short, triangular, tapering; œsophagus wide; stomach rather small, oblong, muscular, the cuticular lining dense, with nine broad longitudinal rugæ; intestine rather long, narrow; cœca very small; cloaca large, globular; the digestive organs are precisely similar to those of the Terns and smaller Gulls.

BLACK SKIMMER OR RAZOR-BILLED SHEARWATER.

RHYNCHOPS NIGRA, *Linn.*

PLATE CCCCXXVIII.—MALE.

This bird, one of the most singularly endowed by nature, is a constant resident on all the sandy and marshy shores of our more southern States, from South Carolina to the Sabine river, and doubtless also in Texas, where I found it quite abundant in the beginning of spring. At this season parties of Black Skimmers extend their movements eastward as far as the sands of Long Island, beyond which however I have not seen them. Indeed in Massachusetts and Maine this bird is known only to such navigators as have observed it in the southern and tropical regions.

To study its habits, therefore, the naturalist must seek the extensive sandbars, estuaries, and mouths of the rivers of our Southern States, and enter the sinuous bayous intersecting the broad marshes along their coasts. There, during the warm sunshine of the winter days, you will see thousands of Skimmers, covered as it were with their gloomy mantles, peaceably lying beside each other, and so crowded together as to present to your eye the appearance of an immense black pall accidentally spread on the sand. Such

times are their hours of rest, and I believe of sleep, as, although partially diurnal, and perfectly able to discern danger by day, they rarely feed then, unless the weather be cloudy. On the same sands, yet apart from them, equal numbers of our Black-headed Gulls may be seen enjoying the same comfort in security. Indeed, the Skimmers are rarely at such times found on sand or gravel banks which are not separated from the neighbouring shores by some broad and deep piece of water. I think I can safely venture to say that in such places, and at the periods mentioned, I have seen not fewer than ten thousand of these birds in a single flock. Should you now attempt to approach them, you will find that as soon as you have reached within twice the range of your long duck-gun, the crowded Skimmers simultaneously rise on their feet, and watch all your movements. If you advance nearer, the whole flock suddenly taking to wing, fill the air with their harsh cries, and soon reaching a considerable height, range widely around, until, your patience being exhausted, you abandon the place. When thus taking to wing in countless multitudes, the snowy white of their under parts gladdens your eye, but anon, when they all veer through the air, the black of their long wings and upper parts produces a remarkable contrast to the blue sky above. Their aërial evolutions on such occasions are peculiar and pleasing, as they at times appear to be intent on removing to a great distance, then suddenly round to, and once more pass almost over you, flying so close together as to appear like a black cloud, first ascending, and then rushing down like a torrent. Should they see that you are retiring, they wheel a few times close over the ground, and when assured that there is no longer any danger, they alight pell-mell, with wings extended upwards, but presently closed, and once more huddling together they lie down on the ground, to remain until forced off by the tide. When the Skimmers repose on the shores of the mainland during high water, they seldom continue long on the same spot, as if they felt doubtful of security ; and a person watching them at such times might suppose that they were engaged in searching for food.

No sooner has the dusk of evening arrived than the Skimmers begin to disperse, rise from their place of rest singly, in pairs, or in parties from three or four to eight or ten, apparently according to the degree of hunger they feel, and proceed in different directions along parts of the shores previously known to them, sometimes going up tide-rivers to a considerable distance. They spend the whole night on wing, searching diligently for food. Of this I had ample and satisfactory proof when ascending the St. John river in East Florida, in the United States schooner Spark. The hoarse cries of the Skimmers never ceased more than an hour, so that I could easily know whether they were passing upwards or downwards in the

dark. And this happened too when I was at least a hundred miles from the mouth of the river.

Being aware, previously to my several visits to the peninsula of the Floridas and other parts of our southern coasts where the Razor-bills are abundant, of the observations made on this species by M. LESSON, I paid all imaginable attention to them, always aided by an excellent glass, in order to find whether or not they fed on bivalve shell-fish found in the shallows of sand-bars and other places at low water; but not in one single instance did I see any such occurrence, and in regard to this matter I agree with WILSON in asserting that, while with us, these birds do not feed on shell-fish. M. LESSON'S words are as follows:—"Quoique le Bec-en-ciseaux semble defavorisé par la forme de son bec, nous acquimes la preuve qu'il savait s'en servir avec avantage et avec la plus grande adresse. Les plages sabloneuses de Peuce sont en effect remplies de Mactres, coquilles bivalves, que la marée descendante laisse presque à sec dans des petites mares; le Bec-en-ciseaux très au fait de cet phemomène, se place auprès de ces mollusques, attend que leur valves s'entrouvrent un peu, et profite aussitot de ce movement en enforçant la lame inferieure et tranchante de son bec entre les valves qui se reserrent. L'oiseau enleve alors la coquille, la frappe sur la grève, coupe le ligament du mollusque, et peut ensuite avaler celui-ci sans obstacle. Plusieurs fois nous avons été temoins de cet instinct très perfectionné."

While watching the movements of the Black Skimmer as it was searching for food, sometimes a full hour before it was dark, I have seen it pass its lower mandible at an angle of about 45 degrees into the water, whilst its *moveable* upper mandible was elevated a little above the surface. In this manner, with wings raised and extended, it ploughed as it were, the element in which its quarry lay to the extent of several yards at a time, rising and falling alternately, and that as frequently as it thought it necessary for securing its food when in sight of it; for I am certain that these birds never immerse their lower mandible until they have observed the object of their pursuit, for which reason their eyes are constantly directed downwards like those of Terns and Gannets. I have at times stood nearly an hour by the side of a small pond of salt water having a communication with the sea or a bay, while these birds would pass within a very few yards of me, then apparently quite regardless of my presence, and proceed fishing in the manner above described. Although silent at the commencement of their pursuit, they become noisy as the darkness draws on, and then give out their usual call notes, which resemble the syllables *hurk*, *hurk*, twice or thrice repeated at short intervals, as if to induce some of their companions to follow in their wake. I have seen a few of these birds glide in this manner in search of prey over a long salt-marsh bayou, or inlet, following the whole of its sinu

osities, now and then lower themselves to the water, pass their bill along the surface, and on seizing a prawn or a small fish, instantly rise, munch and swallow it on wing. While at Galveston Island, and in the company of my generous friend EDWARD HARRIS and my son, I observed three Black Skimmers, which having noticed a Night Heron passing over them, at once rose in the air, gave chase to it, and continued their pursuit for several hundred yards, as if intent on overtaking it. Their cries during this chase differed from their usual notes, and resembled the barkings of a very small dog.

The flight of the Black Skimmer is perhaps more elegant than that of any water bird with which I am acquainted. The great length of its narrow wings, its partially elongated forked tail, its thin body and extremely compressed bill, all appear contrived to assure it that buoyancy of motion which one cannot but admire when he sees it on wing. It is able to maintain itself against the heaviest gale; and I believe no instance has been recorded of any bird of this species having been forced inland by the most violent storm. But, to observe the aërial movements of the Skimmer to the best advantage, you must visit its haunts in the love season. Several males, excited by the ardour of their desires, are seen pursuing a yet unmated female. The coy one, shooting aslant to either side, dashes along with marvellous speed, flying hither and thither, upwards, downwards, in all directions. Her suitors strive to overtake her; they emit their love-cries with vehemence; you are gladdened by their softly and tenderly enunciated *ha, ha,* or the *hack, hack, cae, cae,* of the last in the chase. Like the female they all perform the most curious zigzags, as they follow in close pursuit, and as each beau at length passes her in succession, he extends his wings for an instant, and in a manner struts by her side. Sometimes a flock is seen to leave a sand-bar, and fly off in a direct course, each individual apparently intent on distancing his companions; and then their mingling cries of *ha, ha, hack, hack, cae, cae,* fill the air. I once saw one of these birds fly round a whole flock that had alighted, keeping at the height of about twenty yards, but now and then tumbling as if its wings had suddenly failed, and again almost upsetting, in the manner of the Tumbler Pigeon.

On the 5th of May, 1837, I was much surprised to find a large flock of Skimmers alighted and apparently asleep, on a dry grassy part of the interior of Galveston Island in Texas, while I was watching some Marsh Hawks that were breeding in the neighbourhood. On returning to the shore, however, I found that the tide was much higher than usual, in consequence of a recent severe gale, and had covered all the sand banks on which I had at other times observed them resting by day.

The instinct or sagacity which enables the Razor-bills, after being scattered in all directions in quest of food during a long night, often at great distances

from each other, to congregate again towards morning, previously to their alighting on a spot to rest, has appeared to me truly wonderful; and I have been tempted to believe that the place of rendezvous had been agreed upon the evening before. They have a great enmity towards Crows and Turkey Buzzards when at their breeding ground, and on the first appearance of these marauders, some dozens of Skimmers at once give chase to them, rarely desisting until quite out of sight.

Although parties of these birds remove from the south to betake themselves to the eastern shores, and breed there, they seldom arrive at Great Egg Harbour before the middle of May, or deposit their eggs until a month after, or about the period when, in the Floridas and on the coast of Georgia and South Carolina, the young are hatched. To these latter sections of the country we will return, reader, to observe their actions at this interesting period. I will present you with a statement by my friend the Rev. JOHN BACHMAN, which he has inserted in my journal. "These birds are very abundant, and breed in great numbers on the sea islands at Bull's Bay. Probably twenty thousand nests were seen at a time. The sailors collected an enormous number of their eggs. The birds screamed all the while, and whenever a Pelican or Turkey Buzzard passed near, they assailed it by hundreds, pouncing on the back of the latter, that came to rob them of their eggs, and pursued them fairly out of sight. They had laid on the dry sand, and the following morning we observed many fresh-laid eggs, when some had been removed the previous afternoon." Then, reader, judge of the deafening angry cries of such a multitude, and see them all over your head begging for mercy as it were, and earnestly urging you and your cruel sailors to retire and leave them in the peaceful charge of their young, or to settle on their lovely rounded eggs, should it rain or feel chilly.

The Skimmer forms no other nest than a slight hollow in the sand. The eggs, I believe, are always three, and measure an inch and three quarters in length, an inch and three-eighths in breadth. As if to be assimilated to the colours of the birds themselves, they have a pure white ground, largely patched or blotched with black or very dark umber, with here and there a large spot of a light purplish tint. They are as good to eat as those of most Gulls, but inferior to the eggs of Plovers and other birds of that tribe. The young are clumsy, much of the same colour as the sand on which they lie, and are not able to fly until about six weeks, when you now perceive their resemblance to their parents. They are fed at first by the regurgitation of the finely macerated contents of the gullets of the old birds, and ultimately pick up the shrimps, prawns, small crabs, and fishes dropped before them. As soon as they are able to walk about, they cluster together in the manner of the young of the Common Gannet, and it is really marvellous how the

parents can distinguish them individually on such occasions. This bird walks in the manner of the Terns, with short steps, and the tail slightly elevated. When gorged and fatigued, both old and young birds are wont to lie flat on the sand, and extend their bills before them; and when thus reposing in fancied security, may sometimes be slaughtered in great numbers by the single discharge of a gun. When shot at while on wing, and brought to the water, they merely float, and are easily secured. If the sportsman is desirous of obtaining more, he may easily do so, as others pass in full clamour close over the wounded bird.

BLACK SKIMMER or SHEAR-WATER, *Rhynchops nigra*, Wils. Amer. Orn., vol. vii. p. 85.
RHINCOPS NIGRA, Bonap. Syn., p. 352.
BLACK SKIMMER, Nutt. Man., vol. ii. p. 264.
BLACK SKIMMER or RAZOR-BILLED SHEAR-WATER, *Rhynchops nigra*, Aud. Orn. Biog., vol. iv. p. 203.

Male, 20, 48. Female, 16¾, 44½.

During winter, in vast multitudes on the coast of Florida. In summer dispersed in large flocks from Texas to New Jersey, breeding on sand beaches or islands. In the evenings and at night ascends streams sometimes to the distance of one hundred miles.

Adult Male.

Bill longer than the head, nearly straight, tetragonal at the base, suddenly extremely compressed, and continuing so to the end. Upper mandible much shorter than the lower, its dorsal outline very slightly convex, its ridge sharp, the sides erect, more or less convex, the edges approximated so as to leave merely a very narrow groove between them; the tip a little rounded when viewed laterally. Nasal groove rather short, narrow near the margin; nostrils linear-oblong, sub-basal in the soft membrane. Lower mandible with the angle extremely short, the dorsal outline straight or slightly decurved, the sides erect, the edges united into a very thin blade which fits into the narrow groove of the upper mandible, the tip rounded or abrupt when viewed laterally.

Head rather large, oblong, considerably elevated in front. Neck short and thick. Body short, ovate, and compact. Feet short, moderately stout; tibia bare below, with narrow transverse scutella before and behind; tarsus short, moderately compressed, anteriorly covered with broad scutella, reticulated on the sides and behind; toes very small; the first extremely short, and free; the inner much shorter than the outer, which is but slightly exceeded by the middle toe; the webs very deeply concave at the margin, especially the inner. Claws long, compressed, tapering, slightly arched, rather obtuse, the inner edge of the middle toe dilated and extremely thin. Plumage

moderately full, soft, and blended; the feathers oblong and rounded. Wings extremely elongated, and very narrow; the primary quills excessively long; the first longest, the rest rapidly graduated; the secondaries short, broad, incurved, obliquely pointed, some of the inner more elongated. Tail rather short, deeply forked, of twelve feathers, disposed in two inclined planes.

Bill of a rich carmine, inclining to vermilion for about half its length, the rest black. Iris hazel. Feet of the same colour as the base of the bill, claws black. The upper parts are deep brownish-black; the secondary quills, and four or five of the primaries, tipped with white; the latter on their inner web chiefly. Tail-feathers black, broadly margined on both sides with white, the outer more extensively; the middle tail-coverts black, the lateral black on the inner and white on the outer web. A broad band of white over the forehead, extending to the fore part of the eye; cheeks and throat of the same colour; the rest of the neck and lower parts in spring and summer of a delicate cream-colour; axillary feathers, lower wing-coverts, and a large portion of the secondary quills, white; the coverts along the edge of the wing black.

Length from point of upper mandible to end of tail 20 inches, to end of wings 24½, to end of claws 17; to carpal joint 8½; extent of wings 48; upper mandible 3⅛; its edge 3⅞; from base to point of lower mandible 4½; depth of bill at the base 1; wing from flexure 15⅝; tail to the fork 3½; to end of longest feather 5¼; tarsus 1¼; hind toe and claw $\frac{4}{12}$; middle toe $\frac{10}{12}$ its claw $\frac{4}{12}$. Weight 13 oz.

The Female, which is smaller, is similar to the male, but with the tail-feathers white, excepting a longitudinal band including the shaft.

Length to end of tail 16¾, to end of wings 20¼, to end of claws 16½, to carpus 8; extent of wings 44½. Weight 10 oz.

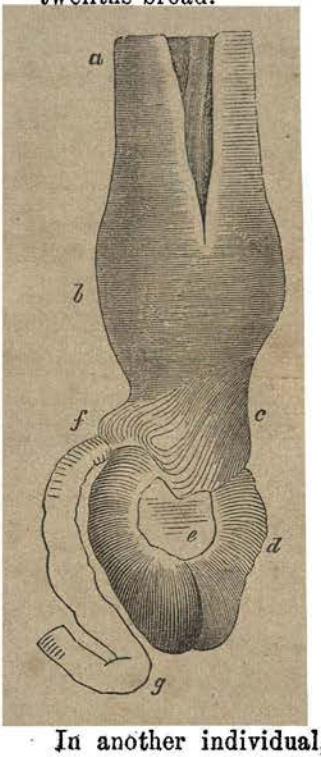
After the first autumnal moult there is on the hind part of the neck a broad band of white, mottled with greyish-black; the lower parts pure white, the upper of a duller black; the bill and feet less richly coloured.

Length to end of tail 16¾ inches, to end of wings 20, to end of claws 14½; to carpus 6⅝; extent of wings 42.

In some individuals at this period the mandibles are of equal length.

The palate is flat, with two longitudinal series of papillæ directed backwards. The upper mandible is extremely contracted, having internally only a very narrow groove, into which is received the single thin edge of the lower mandible. The posterior aperture of the nares is $1\frac{3}{12}$ inches long, with a transverse line of papillæ at the middle on each side, and another behind. The tongue is sagittiform, 6½ twelfths long, with two conical papillæ at the base, soft, fleshy, flat above, horny beneath. Aperture of the glottis 4½ twelfths long, with numerous small papillæ behind. Lobes of the

liver equal, 1¼ inches long. The heart of moderate size, $1\frac{1}{12}$ long, 10 twelfths broad.



The œsophagus, of which only the lower portion, *a*, is seen in the figure, is 8 inches long, gradually contracts from a diameter of 1 inch to 4 twelfths, then enlarges until opposite the liver, where its greatest diameter is $1\frac{4}{12}$. Its external transverse fibres are very distinct, as are the internal longitudinal. The proventriculus, *b*, is 9 twelfths long, its glandules extremely small and numerous, roundish, scarcely a quarter of a twelfth in length. The stomach, *c d e*, is rather small, oblong, 1 inch 4 twelfths long, 11 twelfths broad, muscular, with the lateral muscles moderate. The cuticular lining of the stomach is disposed in nine broad longitudinal rugæ of a light red colour, as in the smaller Gulls and Terns. Its lateral muscles are about 4 twelfths thick, the tendons, *e*, 6 twelfths in diameter. The intestine is 2 feet 4 inches long, its average diameter 2½ twelfths. The rectum is 2 inches long. One of the cœca is 4, the other 3 twelfths, their diameter 1¼ twelfths.

In another individual, the intestine is 22¾ inches long; the cœca 5 twelfths long, 1 twelfth in diameter; the rectum 1¾ inches long; the cloaca 9 twelfths in diameter.

The trachea is 5¾ inches long, round, but not ossified, its diameter at the top 5 twelfths, contracting gradually to 2½ twelfths. The lateral or contractor muscles are small; the sterno-tracheal slender; there is a pair of inferior laryngeals, going to the last ring of the trachea. The number of rings is 90, and a large inferior ring. The bronchi are of moderate length, but wider, their diameter being 3¼ twelfths at the upper part; the number of their half-rings about 18.

The digestive organs of this bird are precisely similar to those of the Terns and smaller Gulls, to which it is also allied by many of its habits.

Genus II.—STERNA, *Linn.* TERN.

Bill longer than the head, rather stout or slender, nearly straight, compressed, very acute; upper mandible with the dorsal line slightly arched, the ridge rather broad and convex at the base, gradually narrowed toward the end, sides convex, edges sharp and direct, tip acute; nasal groove short; lower mandible with the angle very narrow, acute, extending to the middle, the dorsal line straight, the sides slightly convex, nearly erect, the sharp edges inflected, the tips very acute. Nostrils basal, lateral, linear, direct. Head rather large, oblong; neck of moderate length and thick; body slender. Feet short, moderately stout; tibia bare for a considerable space; tarsus short, roundish, covered all round with small scales; first toe very small, third longest, fourth a little shorter; anterior toes connected by emarginate webs. Claws slightly curved, compressed, acute. Plumage soft, close, blended, rather compact on the back and wings. Wings extremely long, narrow, and pointed, the first quill longest, the rest rapidly graduated. Tail long, generally forked, of twelve feathers. Tongue very slender, tapering, with the point slit; œsophagus extremely wide; proventricular belt complete; stomach rather small, moderately muscular, with the epithelium dense and longitudinally rugous; intestine of moderate length, rather narrow; cœca small.

THE CAYENNE TERN.

STERNA CAYANA, *Lath.*

PLATE CCCCXXIX.—MALE.

On reaching the entrance of the little port of St. Augustine in East Florida, I observed more Cayenne Terns together than I had ever before seen. I had afterwards good opportunities of watching them both during that season and the following, about the Keys. Their shyness surprised me not a little, especially as they are very seldom molested, and it was such that I could study their habits only with the aid of a good glass. I found them at first in great flocks, composed of several hundred individuals, along with Razor-billed Shearwaters, which also congregated there in great numbers. During low water, both species resorted to a large flat sand-bar in the middle of the channel, where they reposed until the return of the tide, sitting close together, in an easy posture, with their heads facing the breeze. They kept separate, however, placing themselves in parallel lines twenty or thirty paces asunder, and either lay flat on the sand, or stood up and plumed themselves. My attempts to procure some of them were always futile, for they flew off when I was yet several hundred yards distant, and moved directly towards the sea. It was pleasing to see the whole of these birds take to wing at the same moment, the jetty hue of the Shearwaters contrasting with the pale blue of the Terns, and the brilliantly-coloured bills of both species, their different modes of flight, and their various evolutions presenting a most agreeable sight. The Terns on these occasions constantly emitted their harsh loud cries, while the Shearwaters moved in perfect silence. After spending several days in unsuccessful endeavours to approach them, I employed several boats, which advanced towards the sands at several points, and we shot as many as we wished, for as the flocks passed over any of the boats, several individuals were brought down at once, on which the rest would assail the gunners, as if determined to rescue their brethren, and thus afford subjects for them on which to exercise their skill. We found it necessary to use large shot, the Cayenne Tern being a strong and tough bird, the largest of the genus met with on our Atlantic coasts. When wounded, however slightly, they disgorged in the manner of Vultures; and when brought to the water disabled, they at once endeavoured to make off from

Cayenne Tern.

Drawn from Nature by J. J. Audubon, FRSFLS.

Lith.ª Printed & Col.ª by J. T. Bowen, Philad.ª

the shores, swimming with buoyancy and grace, though without making much progress. When seized they at once erected their beautiful crest, threw up the contents of their stomach, uttered loud cries, and bit severely. One that was merely touched in the wing, and brought ashore, through a high surf, by my Newfoundland dog, stuck fast to his nose until forced to relinquish its hold by having its throat squeezed, after which it disgorged seven partially digested fishes.

Although the Cayenne Tern often searches for food over the sea, and at times several miles from the shore, it gives a decided preference to the large inlets running parallel to the coast of the Floridas, within the high sandy embankments, as well as the rivers in the interior of the peninsula. They alight on the banks of racoon oysters, so abundant in the inlets, and are seen in company with the Semipalmated Snipe and the American Oystercatcher, searching for food like these birds, and devouring crabs and such fishes as are confined in small shallow pools. These they catch with considerable agility, in a manner not employed by any of our other Terns. While on the St. John's river, I saw them alight on stakes, in the manner of the Marsh Tern and the Noddy; and as I ascended that stream, I often saw them, at the distance of seventy miles from the sea, perched in the middle of the river, on the same sticks as the Florida Cormorants, and found them more easily approached in the dusk than during broad daylight. Until then I had supposed this species to be entirely oceanic, and averse from mingling with any other.

The flight of the Cayenne Tern is strong and well sustained, although less lively or graceful than that of the smaller species, excepting on particular occasions. They usually incline their bill downwards, as they search for their prey, like the other Terns, but keep at a much greater height, and plunge towards the waters with the speed of an arrow, to seize on small fishes, of which they appear to capture a great number, especially of the "mullets," which we saw moving about in shoals, composed of individuals of different sizes. When travelling, these birds generally proceed in lines; and it requires the power of a strong gale to force them back, or even to impede their progress, for they beat to windward with remarkable vigour, rising, falling, and tacking to right and left, so as to seize every possible opportunity of making their way. In calm and pleasant weather, they pass at a great height, with strong unremitted flappings, uttering at intervals their cries, which so nearly resemble the shrieking notes of our little Parrakeet, that I have often for a moment thought I heard the latter, when in fact it was only the Tern. At times their cries resemble the syllables *kwee-reek*, repeated several times in succession, and so loudly as to be heard at the distance of half a mile or more, especially when they have been disturbed at

their breeding places, on which occasion they manifest all the characteristic violence of their tribe, although they are much more guarded than any other species with which I am acquainted, and generally keep at a considerable distance from their unwelcome visiters.

On the 11th of May, 1832, I found the Cayenne Terns breeding on one of the Tortugas. There they had dropped their eggs on the bare sand, a few yards above high-water mark, and none of the birds paid much attention to them during the heat of the day. You may judge of my surprise when, on meeting with this Tern breeding on the coast of Labrador, on the 18th of June, 1833, I found it sitting on two eggs deposited in a nest neatly formed of moss and placed on the rocks, and this on a small island, in a bay more than twelve miles from our harbour, which itself was at some distance from the open Gulf. On another equally sequestered islet, some were found amidst a number of nests of our Common Gull; and, during my stay in that country, I observed that this Tern rarely went to the vicinity of the outer coast, for the purpose of procuring food, probably because there was an extreme abundance of small fishes of several kinds in every creek or bay. Until that period I was not aware that any Tern could master the *Lestris Pomarinus*, to which, however, I there saw the Cayenne Tern give chase, driving it away from the islands on which it had its eggs. On such occasions, I observed that the Tern's power of flight greatly exceeded that of the Jager; but the appearance of the Great Black-Backed Gull never failed to fill it with dismay, for although of quicker flight, none of the Terns dared to encounter that bird, any more than they would venture to attack the Frigate Pelican in the Floridas.

The Cayenne Tern usually lays two eggs; in a few instances I found only one, and I concluded that no more had been laid, as it contained a chick, which would not have been there had the Great Gull ever visited the nest. The eggs measure two inches and six-eighths in length, by one inch and six and a half eighths in breadth, and are rather sharp at the smaller end. They have a pale yellowish ground colour, irregularly spotted with dark umber and faint purplish marks, dispersed all over but not close. The eggs, like those of the other species, afford good eating.

I never saw the young of this bird while small, and cannot speak of the changes which they undergo from their first state until autumn. Then, however, they greatly resemble the young of the Sandwich Tern, their colour being on the upper parts of a dark greyish-brown, transversely marked with umber, and on the lower dull white. While in this plumage, they keep by themselves, in flocks of fifty or more individuals, and remain separated from the old birds until spring, when they have acquired the full beauty of their plumage, although they appear rather inferior in size.

My surprise at finding this species breeding in Labrador was increased by the circumstance of its being of rare occurrence at any season along the coasts of our Middle and Eastern Districts. Nor does it become abundant until you reach the shores of North Carolina, beyond which it increases the farther south you proceed. It winters in the Floridas, and along the shores of the Mexican Gulf; but I never saw it far up the Mississippi. While on the coast of Newfoundland, on the 14th of August, I saw several individuals on their way southward, flying very high, and keeping up their remarkable cries.

The flesh of every species of Tern is oily, like that of the Gulls and Jagers, and the smallest hole made by shot affords an exit to the grease, which is apt to destroy the beauty of their elastic plumage, so that it is very difficult to preserve them, both on account of this circumstance, and of the quantity of oil that flows from their bill. In no species have I found this to be more remarkably the case than in the Cayenne Tern.

The figure of the *crab* in the plate was introduced on account of its singularly bright red colour, which, when the animal is boiled, changes to pale yellow. It is rather common along the rocky shores of some of the Florida Keys, and is excellent eating.

STERNA CAYANA, Bonap. Syn., vol. ii. p. 353.
CAYENNE TERN, Nutt. Man., vol. ii. p. 208.
CAYENNE TERN, *Sterna cayana*, Aud. Orn. Biog., vol. iii. p. 505; vol. v. p. 639.

Male, 19, 44.

From Texas, in spring, to the Floridas, where it breeds on the Tortugas. Labrador, but not observed in the intermediate parts of the Atlantic coast. Abundant. Migratory.

Adult Male in spring.

Bill longer than the head, stout, nearly straight, compressed, very acute. Upper mandible with the dorsal line slightly arched, the ridge broad and convex at the base, narrowed towards the end, the sides convex, the edges sharp and direct, the tip acute. Nasal groove short; nostrils basal, lateral, linear, direct, pervious. Lower mandible with the angle very narrow, acute, extending to the middle, the dorsal line straight, the sides slightly convex, nearly erect, the sharp edges inflected, the tip very acute.

Head rather large, oblong; neck of moderate length and thick; body rather slender; feet short, stout. Tibia bare for a considerable space; tarsus short, roundish, covered all round with small scales; first toe very small, third longest, fourth a little shorter, the anterior connected by reticulated webs having an incurved margin; claws slightly curved, compressed, acute,

that of hind toe smallest, of middle toe by much the largest, and having the inner edge thin and dilated.

Plumage soft, close, blended, very short on the fore part of the head, elongated behind, rather compact on the back and wings. Wings extremely long, narrow, and pointed; primary quills tapering but rounded, the first longest, the rest rapidly graduated; secondary short, rather narrow, tapering, rounded. Tail long, deeply forked, of twelve feathers, of which the outer taper to a rounded point.

Bill bright carmine, the tips paler. Iris dark brown. Feet black. The top of the head and occiput is greenish-black; the back and wings light greyish-blue; the primary quills bluish-grey on their outer webs, darker on the outer part of the inner, their inner part white, as are the ends and inner webs of the secondaries; upper tail-coverts and tail greyish-white; all the other parts are pure white.

Length to end of tail 19 inches, to end of wings 20¼; extent of wings 44; wing from flexure 15; tail 7; bill along the back 2⅜, along the edge of lower mandible 1$\frac{11}{12}$; tarsus 3$\frac{2}{12}$; middle toe 1, its claw ½. Weight 14½ oz.

The width of the mouth is 1¼ inches; the palate flat, with two prominent papillate ridges, the anterior part with five faint elevated lines; the posterior aperture of the nares linear, 1¾ inches long, margined with papillæ. Tongue 1 inch 11 twelfths long, narrow, fleshy above, horny beneath, channelled, and tapering to a slit horny point. Œsophagus 9 inches long, at its commencement 1 inch 9 twelfths wide, presently after 1½ inches, then contracting to 1¼ inches, and within the thorax enlarging to 1½ inches. In its form and structure it is exactly similar to that of the Gulls. The stomach is of moderate size, 2 inches long, 1 inch 9 twelfths broad; its lateral muscles rather thin; the epithelium thin but very dense, longitudinally rugous, and of a bright red colour. The proventricular glands, which are very numerous and small, form a belt only 7 twelfths in breadth. The lobes of the liver are unequal, the right 2½ twelfths, the left 2¾ twelfths in length; the gall-bladder 8 twelfths long, 4½ twelfths broad. The intestine measures 34 inches in length, 6 twelfths in width at the upper part, contracting to 3 twelfths. Cœca 4¾ twelfths long, 2 twelfths wide; their distance from the extremity only 2¼ inches; rectum 4 twelfths wide, but enlarging into a globular cloaca 10 twelfths in diameter.

The trachea is 6¾ inches long, very wide at the top, where it measures 6 twelfths, gradually diminishing to 3 twelfths; its rings unossified, very feeble, contracted before and behind, in the middle being 112 in number. Bronchi large, one with 28, the other with 30 half rings. The muscles exactly as in the Gulls.

In the œsophagus, stomach, and intestine, this bird, as well as the other

Gull-billed Tern - Marsh Tern.

Male.

Drawn from Nature by J.J. Audubon F.R.S.F.L.S. Lith.d Printed & Col.d by J.T. Bowen, Philad.a

Terns, is precisely similar to the smaller Gulls, as it is also in the form, structure, and muscles of the trachea. In these respects, the Terns also resemble the Shearwater. The bill of the Cayenne Tern evidently indicates an affinity to the Phaetons, and in a less degree to the Gannets, as does the head, which is very large in proportion to the bird. On the other hand, as regards the bill, the affinity is to the larger Gulls and the Shearwater. The feet resemble those of the Gulls, but are proportionally smaller, these birds being more volatorial, and the Gulls combining that character with an affinity to the *wading* birds, while the Shearwater exhibits the abbreviated feet of the purely *flying* birds in a still greater degree."

MARSH OR GULL-BILLED TERN.

STERNA ANGLICA, *Montagu.*

PLATE CCCCXXX.—MALE.

Having taken six specimens of the Marsh Tern of America to the British Museum, and minutely compared them in all their details with the specimens of the Gull-billed Tern which formed part of the collection of Colonel MONTAGU, and were procured in the south of England, I found them to agree so perfectly that no doubt remained with me of the identity of the bird loosely described by WILSON with that first distinguished by the English ornithologist.

I have shot several Marsh Terns out of the same flock, in the early part of spring, when the youngest must therefore have been nearly a year old, and found them all equally perfect and beautiful in their plumage, but differing considerably in the length of their bills, tarsi, toes, and wings, insomuch that a person bent on forming new species might easily gratify his inclination by founding "specific characters" on differences, which, however, would be merely those of males and females of different ages. With me the habits of birds, when minutely and faithfully described, go much farther to establish the identity of individuals found in the different parts of the globe, than the best and closest descriptions of prepared skins. Colonel MONTAGU informs us that the Gull-billed Tern, *Sterna anglica*, resorts by

preference to lakes and rivers of the interior; and Mr. SELBY states, that "on the European continent it frequents the marshes and the lakes of Neusidel and Platten in Hungary." The same naturalist also says: "Upon investigating specimens from North America, I feel no hesitation in considering the *Marsh Tern* of WILSON'S North American Ornithology to be the same bird, although Mr. ORD (in his eighth volume of that work) is inclined to regard it as distinct, in consequence of some difference between the length of the bill and tarsi, as expressed in a *drawing* of *Sterna aranea* that he examined, and the proportions of those parts in the first species as given by MONTAGU and TEMMINCK."

Now, reader, allow me to lay before you an account of the habits of the Marsh Tern, a figure of an adult individual selected from among three shot within a few hours of each other, and the measurements of several recent birds. You may then judge whether or not our bird is that described by MONTAGU.

The Marsh Tern is pretty abundant about the salt-marshes of the mouths of the Mississippi in the beginning of April; and by following the shores of the Gulf of Mexico, you will find that it comes to us from beyond Texas, as many make their appearance along that coast in a straggling manner during spring, there being seldom more than half a dozen together, and generally only two. Their journeys are performed over the waters of the sea, a few hundred yards from the shore; and when in want of food, they diverge from their ordinary course, and ranging over the land satisfy their hunger, when they resume their route.

Excepting the Cayenne Tern, I know no American species that has so powerful a flight as the present. To this power is added an elegant lightness that renders it most conspicuous and pleasing during the love season. Then "the happy pair" are seen to rise in elegant circling sweeps, almost in the manner of Hawks, and only a few feet apart, until they attain a height of about two hundred yards, when they come close together, and then glide with extended pinions through the air, the male over the female, both emitting tender and plaintive notes, while they vary their evolutions at the same height for five or six minutes. After this the winged lovers separate, plunge towards the earth with wonderful rapidity, resume their ordinary notes, and seek for food in concert. The usual cry of these birds is rough, sharp, distinguishable at a considerable distance, and often repeated as if to assure each other that they are near. When an accident happens to the female during the breeding season, her mate manifests a most affectionate concern; but the female in such a case acts differently. On shooting several males on various occasions, whether they were killed outright, or fell wounded on the earth or the water, I observed that the female would only take a round as she rose

above the reach of shot, and move off at once to some considerable distance; but when the female dropped, if on the water, the male would plunge headlong toward her, and alighting by her side, would do all in his power to aid her in swimming or flying off. If she fell on the ground, he would alight there, and exhibit the same marks of anxious care, thus affording to the gunner the best possible opportunity of destroying him.

The Marsh Tern swims buoyantly but not swiftly, and when wounded does not attempt to dive, but when taken in the hand bites rather severely, though without uttering cries, in which latter respect it differs from the other species. Whilst travelling or inspecting the pools of the marshes, or the bayous intersecting them, it passes at a considerable height with quickly repeated movements of the wings, and when looking for food, it darts through the air and slides toward the waters, as if about to dive for fish. I have observed them coming over large mud-flats and marshes to bayous, apparently for the latter purpose; but I believe that these birds never immerse themselves in the water, as other Terns are wont to do; nor do I think that they procure fish, as on examining a number of individuals near the mouths of the Mississippi, in Texas, and at Great Egg Harbour, I never found any other food in their stomachs than insects of various kinds, including coleoptera, which were unknown to me. In many instances, when near the places first mentioned, my friend EDWARD HARRIS and myself saw them catching insects on wing over a small pond of almost putrid water, the surface of which was entirely covered with a thick green layer of water-plants. The same manner of procuring food was observed over the dry land at Barataria, where they seized insects by diving as it were close to the ground and again rising to a considerable height. Their plunges were performed with great velocity, generally by the males and females alternately. In two or three instances, I have seen some of these birds plunge towards the water at sea, but always close on the shore, and have supposed that when insects are scarce on the land, particularly during their migration southward, they may be forced to feed upon fish; but this is merely a supposition, in support of which I have no fact to offer. I look upon what has been said as to their feeding along the sea-shores "almost exclusively on strand birds and their eggs," as ridiculous and absurd.

On the 24th of May I observed this species mastered and driven from its feeding grounds by the King-birds *Muscicapa*, *Tyrannus*, and the Martins, *Hirundo purpurea*. I am inclined to believe that these birds migrate in the same manner as many of our terrestrial species, that is, the females first, by themselves, and afterwards the males.

The Marsh Tern deposits its three eggs on the dried rushes found in the salt marshes at a short distance from the water, and carefully placed beyond

reach of any ordinary encroachment of the tides; for, as WILSON has truly said, this species forms no nest. The eggs differ considerably in their markings. They are generally an inch and three quarters in length, an inch and half an eighth in breadth, smooth, of a greenish or olivaceous tint, largely marked with irregular splashes of dark umber, almost black, disposed around the broadest part, leaving the apex with only a few small dots of the same colour, similar dots being as sparingly dispersed toward the smaller end, which falls off toward the extremity, and is there gently rounded. The parents sit more upon them than is usual with Terns which drop their eggs on the sands, and they do not leave their charge in cloudy weather. The young have the bill of a dull reddish orange-brown colour, the legs and feet of a less deep tint of the latter colour, which is retained by them until late in the winter, when these parts become black, and so continue for life.

The Marsh Tern does not extend its migrations eastward along our shores beyond New England; which will be understood by those who know, that in a continued direction the rocky shores afford them no place in which they could obtain food. But, from what I know of the extraordinary power of flight of this bird, I am not at all surprised at its being found in Europe, any more than I should be to find it cosmopolitan.

I here present the different measurements carefully taken from fresh birds of only four pairs, all shot in spring, and in full plumage, although of different ages. WILSON'S measurements are as follows: "fourteen inches in length, and thirty-four in extent."

	M.	F.	M.	F.	M.	F.	M.	F.
Length to end of tail, .	13	14¾	14½	13½	13½	13½	14½	14
. . . . . claws, .	11	12½	12	11¼	12½	12¾	12	11
. . . . . wings, .	14¼	15	15½	14½	14½	13¼	15¾	14¾
Extent of wings, ...	33	34½	34½	33½	34	34	35¾	35
Tarsus, ...	1⅛	1¼	1	1⅜	1¼	1	1⅜	1⅜

The weight of the four male birds was 6½ oz., 5⅞, 6¾, 7⅛. The females were quite as heavy.

MARSH TERN, *Sterna aranea*, Wils. Amer. Orn., vol. viii. p. 143.

STERNA ARANEA, Bonap. Syn., p. 354.

MARSH TERN, *Sterna anglica*, Nutt. Man., vol. ii. p. 269.

MARSH or GULL-BILLED TERN, *Sterna anglica*, Aud. Orn. Biog., vol. v. p. 127.

Male, 14, 34.

Cosmopolite. In America, breeds from the mouth of the Mississippi to Connecticut. Not abundant. Migratory.

Adult Male in summer.

Bill about the length of the head, rather stout, compressed, acute. Upper

mandible with the dorsal line nearly straight to the anterior edge of the nostrils, then arcuato-declinate, the ridge rather broad and rounded at the base, narrowed toward the end; the sides sloping at the base, nearly erect and convex toward the end, the edges sharp and inflected, the tip although narrow somewhat obtuse. Nasal groove comparatively short; nostrils basal, oblong, direct, pervious. Lower mandible with the angle very narrow and acute, extending to beyond the middle, the outline of the crura a little concave, that of the rest ascending and straight, a prominence or angle being formed at their junction as in Gulls, the sides erect and slightly convex, the edges sharp and inclinate, the tip acute, the gap line straight for half its length, then slightly arcuato-declinate.

Head of moderate size, ovate; neck of moderate length; body slender. Feet small; tibia bare for nearly half an inch; tarsus very short, compressed, anteriorly scutellate; toes small, slender; the first extremely small, the third longest, the fourth considerably shorter; all scutellate above, the anterior connected by reticulated webs, of which the inner is more deeply emarginate. Claws a little arched, compressed, very slender, that of the middle toe much larger, and having its inner edge somewhat dilated.

Plumage soft, close, blended, very short on the fore part of the head. Wings very long, narrow, and pointed; primary quills tapering to an obtuse point; the first longest, the second ten and a half twelfths of an inch shorter, the rest rapidly graduated; secondaries short, incurved, obliquely rounded, some of the inner proportionally longer and narrower. Tail of moderate length, forked, of twelve feathers, of which the middle are rounded and an inch and seven-twelfths shorter than the outer, which tapers to a narrow but obtuse point.

Bill black, as are the feet. Iris brown. The upper part of the head, the nape, and part of the hind neck, deep black; sides of the head, including a line margining the base of the upper mandible, fore neck, and all the lower parts white; upper parts pale greyish-blue; the edges of the wings whitish; the primary quills hoary on the outer web, deep grey on the inner, but with a large portion toward the base lighter, the shafts and those of the tail-feathers white; the tail is of a paler tint than the back, and the outer feather is nearly white.

Length to end of tail 14 inches; extent of wings 34; bill along the ridge $1\frac{6}{12}$, along the edge of lower mandible $2\frac{1}{12}$; wing from flexure $12\frac{1}{12}$; tail to end of middle feather $3\frac{4}{12}$, to end of lateral feather $4\frac{11}{12}$; tarsus $1\frac{4}{12}$; first toe $\frac{3}{12}$, its claw $\frac{3}{12}$; middle toe $\frac{10}{12}$, its claw $\frac{4}{12}$.

A female from the mouths of the Mississippi, April 1, 1837. On the roof of the mouth are three longitudinal ridges; the posterior aperture of the nares is linear, with an anterior slit; the tongue slender, tapering, 1 inch 2

twelfths long, papillate at the base, the outer papilla on each side larger, the tip sharp and horny. The œsophagus, *a b c*, is 5 inches long, very wide, its greatest diameter 9 twelfths. The stomach, *c d e*, is oblong, 1 inch 2 twelfths in length, 10 twelfths in breadth; its lateral muscles moderate. Its contents are coleopterous and hymenopterous insects, together with small crabs. The epithelium is thick, strong, prominently rugous, of a reddish-brown colour, and exactly resembling that of the smaller Gulls. The proventricular glandules are very small, and form a belt ½ inch in breadth. The intestine, *f g h i*, which is 1 foot 8 inches long, is wide, its average diameter being 4½ twelfths. The cœca, which come off at the distance of 2 inches from the anus, are very small, being 3 twelfths long, and 1 twelfth in diameter.

The trachea is 4 inches 2 twelfths long, at the upper part 4 twelfths in breadth, gradually contracting to 1½ twelfths. The rings, about 110, are feeble and unossified. The bronchial rings are about 20. The contractor muscle is so thin as to be scarcely perceptible; the sterno-tracheal extremely slender. There is a single pair of inferior laryngeal muscles.

The stomach of another female contains the remains of crustaceous animals, one of which, nearly entire, is a small roundish crab, 11 twelfths in breadth.

N°87

PL 431

THE SANDWICH TERN.

STERNA CANTIACA, *Gmel.*

PLATE CCCCXXXI.—ADULT.

On the 26th of May, 1832, while sailing along the Florida Keys in Mr. THRUSTON'S barge, accompanied by his worthy pilot and my assistant, I observed a large flock of Terns, which, from their size and other circumstances, I would have pronounced to be Marsh Terns, had not the difference in their manner of flight convinced me that they were of a species hitherto unknown to me. The pleasure which one feels on such an occasion cannot easily be described, and all that it is necessary for me to say on the subject at present is, that I begged to be rowed to them as quickly as possible. A nod and a wink from the pilot satisfied me that no time should be lost, and in a few minutes all the guns on board were in requisition. The birds fell around us; but as those that had not been injured remained hovering over their dead and dying companions, we continued to shoot until we procured a very considerable number. On examining the first individual picked up from the water, I perceived from the yellow point of its bill that it was different from any that I had previously seen, and accordingly shouted "A prize! a prize! a new bird to the American Fauna!" And so it was, good reader, for no person before had found the Sandwich Tern on any part of our coast. A large basket was filled with them, and we pursued our course. On opening several individuals, I found in the females eggs nearly ready for being laid. The males, too, manifested the usual symptoms of increased action in the organs distinctive of the sex. I felt a great desire to discover their breeding grounds, which I had the pleasure of doing in a few days after.

The vigour and activity of this bird while on wing afforded me great pleasure. Indeed its power of flight exceeds that of the Marsh Tern, which I consider as a closely allied species. While travelling, it advances by regular sharp flappings of its wings, which propel it forward much in the manner of the Passenger Pigeon, when, single and remote from a flock, it pushes on with redoubled speed. While plunging after the small mullets and other diminutive fishes that form the principal part of its food, it darts perpendicularly downwards with all the agility and force of the Common

and Arctic Terns, nearly immersing its whole body at times, but rising instantly after, and quickly regaining a position from which it can advantageously descend anew. Should the fish disappear, as the bird is descending, the latter instantly recovers itself without plunging into the water. Its cries are sharp, grating, and loud enough to be heard at the distance of half a mile. They are repeated at intervals while it is travelling, and kept up incessantly when one intrudes upon it in its breeding grounds, on which occasion it sails and dashes over your head, chiding you with angry notes more disagreeable than pleasant to your ear.

How many days these birds had been laying. when I discovered the key on which they breed, I cannot say ; but many of them were still engaged in depositing their eggs, and none were as yet sitting on those which, being three together, seemed to form the full complement. They had been dropped on the sand, at short intervals, with scarcely any appearance of a hollow for their reception. In some instances they were laid at the foot of a scanty tuft of grass; but all were fully exposed to the heat of the sun, which at this time I thought almost sufficient to cook them. The eggs varied as much in colour as those of the Arctic Tern and Foolish Guillemot, and were equally disproportionate to the size of the bird, their average length being two inches and one-eighth, their greatest breadth one inch and three and a half eighths. They are of an oval form, but rather sharp at the larger end. The ground colour is yellowish-grey, varying in depth, and all more or less spotted, blotched, or marked with different tints of umber, pale blue, and reddish. I may add that these eggs are most capital eating.

I never saw the Sandwich Tern on any other portion of our coasts than between the Florida Keys and Charleston, and from whence it first came there, or how it went thence to Europe, is an enigma which may perhaps never be solved. On asking the wreckers if they had been in the habit of seeing these birds, they answered in the affirmative, and added that they paid them pretty frequent visits during the breeding season, on account of their eggs as well as of the young, which, when nearly able to fly, they said were also good eating. According to their account, this species spends the whole winter near and upon the keys, and the young keep separate from the old birds.

SANDWICH TERN, Nutt. Man., vol. ii. p. 276.
SANDWICH TERN, *Sterna cantiaca*, Aud. Orn. Biog., vol. iii. p. 531.

Adult, 15⅜, 33¾.
From Texas, during spring and summer, to the Floridas, where it breeds

in great numbers. Never observed in any other part of the coast of America. Migratory.

Adult Male.

Bill longer than the head, slender, tapering, compressed, nearly straight, very acute. Upper mandible with the dorsal line slightly arched, the ridge rather broad at the base, very narrow towards the tip, the sides sloping at the base, slightly convex and nearly perpendicular towards the end, the edges sharp and inflected, the tip very acute. Nasal groove extending to a little beyond the middle of the bill and deflected towards its edge; nostrils basal, linear, direct, pervious. Lower mandible with the angle very narrow and acute, extending nearly to the middle, the dorsal line beyond it straight, the sides convex, towards the end more erect, the ridge very narrow, the tip extremely acute.

Head of moderate size, oblong; neck of moderate length; body slender. Feet very small; tibia bare for a considerable space; tarsus very short, anteriorly scutellate, laterally and behind reticulated; toes small, slender, the first extremely small, the third longest, the fourth about the same length, the second much shorter, all scutellate above, the anterior connected by reticulated webs of which the margins are deeply concave. Claws arched, compressed, acute, that of hind toe very small, of middle toe by much the largest, and having the inner edge thin and dilated.

Plumage soft, close, blended, very short on the fore part of the head; the feathers on the occiput and upper part of hind neck pointed and elongated. Wings very long, narrow and pointed; primary quills tapering, the outer slightly curved inwards at the end, the first longest, the rest rapidly graduated; secondary short, broad, incurved, rounded, the inner proportionally longer and narrower. Tail rather long, deeply forked, of twelve feathers, the outer tapering to a point.

Bill black, excepting the tips, which are yellow; inside of the mouth deep blue. Iris brown. Feet black. The upper part of the head, occiput and part of hind neck bluish-black. Sides of the head, neck all round, and the rest of the lower parts white, the breast frequently tinged with pink. The fore part of the back, the scapulars and the upper surface of the wings pale greyish-blue; the tips and the greater parts of the inner webs of the scapulars, and quills, white, as are the rump and the tail; the four outer quills blackish, but covered with light grey down, on the outer webs and over a considerable extent of the inner, their shafts white.

Length to end of tail 15$\frac{3}{4}$ inches, to end of wings 16 $\frac{8}{12}$; to end of claws 12$\frac{3}{4}$; extent of wings 33$\frac{3}{4}$; wing from flexure 12$\frac{1}{4}$; tail 6; bill along the back 2$\frac{1}{4}$, along the edge of lower mandible 2$\frac{9}{12}$; tarsus 1$\frac{1}{12}$; middle toe $\frac{9}{12}$, its claw $\frac{5}{12}$. Weight 6$\frac{1}{2}$ oz.

The female is similar to the male.

The young, after the first moult, are of a light greyish-blue colour on the upper parts, the feathers tipped and banded in an undulating manner with brownish-black; the upper part of the head and the hind neck are of the latter colour, but mottled with white. The quills are as in the adult, the tail grey, with irregular brownish-black markings towards the tips of the feathers. The lower parts are also pale grey, but much lighter than the upper. The bill and feet are black, but the tip of the former has not yet assumed a yellow tint.

THE SOOTY TERN.

STERNA FULIGINOSA, *Lath.*

PLATE CCCCXXXII.—MALE.

Early in the afternoon of the 9th of May, 1832, I was standing on the deck of the United States revenue-cutter Marion. The weather was very beautiful, although hot, and a favourable breeze wafted us onwards in our course. Captain ROBERT DAY, who stood near me, on looking toward the south-west, ordered some person to be sent to the top to watch the appearance of land. A young lad was instantly seen ascending the rigging, and not many minutes after he had attained his post, we heard from him the cry of "land." It was the low keys of the Tortugas, toward which we had been steering. No change was made in the course of the "Lady of the Green Mantle," who glided along as if aware of the knowledge possessed by her commander. Now the light-house lantern appeared, like a bright gem, glittering in the rays of the sun. Presently the masts and flags of several wreckers shewed us that they were anchored in the small but safe harbour. We sailed on, and our active pilot, who was also the first lieutenant of the Marion, pointed out to me a small island which he said was at this season the resort of thousands of birds, which he described by calling them "Black and White Sea Swallows," and again another islet, equally well stocked with another kind of Sea Swallow, which he added were called Noddies, because they frequently alighted on the yards of vessels at night, and slept there.

Sooty Tern

Drawn from Nature by J.J.Audubon,F.R.S.F.L.S.

Lith.ª Printed & Col.ª by J. T. Bowen, Phila.ª

He assured me that both species were on their respective breeding-grounds by millions, that the eggs of the first lay on the sand under bushes, at intervals of about a foot, while the nests of the last were placed as thickly on the bushes of their own chosen island. "Before we cast anchor," he added, "you will see them rise in swarms like those of bees when disturbed in their hive, and their cries will deafen you."

You may easily imagine how anxious I was to realize the picture; I expressed a wish to be landed on the island; but the kind officer replied, "My good sir, you will soon be tired of their incessant noise and numbers, and will enjoy the procuring of Boobies much better." After various tacks, we made our way through the curious and extremely dangerous channels leading to the small harbour, where we anchored. As the chain grated the ear, I saw a cloud-like mass arise over the "Bird Key," from which we were only a few hundred yards distant; and in a few minutes the yawl was carrying myself and my assistant ashore. On landing, I felt for a moment as if the birds would raise me from the ground, so thick were they all round, and so quick the motion of their wings. Their cries were indeed deafening, yet not more than half of them took to wing on our arrival, those which rose being chiefly male birds, as we afterwards ascertained. We ran across the naked beach, and as we entered the thick cover before us, and spread in different directions, we might at every step have caught a sitting bird, or one scrambling through the bushes to escape from us. Some of the sailors, who had more than once been there before, had provided themselves with sticks, with which they knocked down the birds as they flew thick around and over them. In less than half an hour, more than a hundred Terns lay dead in a heap, and a number of baskets were filled to the brim with eggs. We then returned on board, and declined disturbing the rest any more that night. My assistant, Mr. H. WARD, of London, skinned upwards of fifty specimens, aided by Captain DAY'S servant. The sailors told me that the birds were excellent eating, but on this point I cannot say much in corroboration of their opinion, although I can safely recommend the eggs, for I considered them delicious, in whatever way cooked, and during our stay at the Tortugas we never passed a day without providing ourselves with a good quantity of them.

The next morning Mr. WARD told me that great numbers of the Terns left their island at two o'clock, flew off towards the sea, and returned a little before day, or about four o'clock. This I afterwards observed to be regularly the case, unless there happened to blow a gale, a proof that this species sees as well during the night as by day, when they also go to sea in search of food for themselves and their young. In this respect they differ from the *Sterna stolida*, which, when overtaken at sea by darkness, even when land

is only a few miles distant, alight on the water, and frequently on the yards of vessels, where, if undisturbed, they sleep until the return of day. It is from this circumstance that they have obtained the name of Noddy, to which in fact they are much better entitled than the present species, which has also been so named, but of which I never observed any to alight on a vessel in which I was for thirty-five days in the Gulf of Mexico, at a time when that bird was as abundant during the day as the other species, of which many were caught at my desire by the sailors.

The present species rarely alights on the water, where it seems incommoded by its long tail; but the other, the *Sterna stolida*, which, in the shape of its tail, and in some of its habits, shews an affinity to the Petrels, not only frequently alights on the sea, but swims about on floating patches of the *gulf weed*, seizing on the small fry and little crabs that are found among the branches of that plant, or immediately beneath them.

I have often thought, since I became acquainted with the habits of the bird which here occupies our attention, that it differs materially from all the other species of the same genus that occur on our coasts. The *Sterna fuliginosa* never dives headlong and perpendicularly as the smaller species are wont to do, such as *St. Hirundo*, *St. arctica*, *St. minuta*, *St. Dougallii*, or *St. nigra*, but passes over its prey in a curved line, and picks it up. Its action I cannot better compare to that of any other bird than the Night Hawk, while plunging over its female. I have often observed this Tern follow and hover in the wake of a porpoise, while the latter was pursuing its prey, and at the instant when by a sudden dash it frightens and drives toward the surface the fry around it, the Tern as suddenly passes over the spot, and picks up a small fish or two.

Nor is the flight of this Tern characterized by the buoyancy aud undecidedness, if I may so speak, of the other species mentioned above, it being as firm and steady as that of the Cayenne Tern, excepting during the movements performed in procuring its food. Like some of the smaller Gulls, this bird not unfrequently hovers close to the water to pick up floating objects, such as small bits of fat pork and greasy substances thrown overboard purposely for making the experiment.

There is a circumstance connected with the habits of the two species of which I now more particularly speak, which although perhaps somewhat out of place, I cannot refrain from introducing here. It is that the *Sterna stolida always forms a nest on trees or bushes*, on which that bird alights with as much ease as a Crow or Thrush; whereas the *Sterna fuliginosa* never forms a nest of any sort, but deposits its eggs in a slight cavity which it scoops in the sand under the trees. But, reader, let us return to the Bird Key.

Early the next morning I was put on shore, and remained there until I had completed my observations on the Terns. I paid no attention to their lamentable cries, which were the less piercing that on this occasion I did not molest them in the least. Having seated myself on the shelly sand, which here formed the only soil, I remained almost motionless for several hours, in consequence of which the birds alighted about me, at the distance of only a few yards, so that I could plainly see with what efforts and pains the younger females deposited their eggs. Their bill was open, and their pantings indicated their distress, but after the egg had been expelled, they immediately walked off in an awkward manner, until they reached a place where they could arise without striking the branches of the bushes near them, when they flew away. Here and there, in numerous places within twenty yards of me, females, having their complement of eggs, alighted, and quietly commenced the labour of incubation. Now and then a male bird also settled close by, and immediately disgorged a small fish within the reach of the female. After some curious reciprocal nods of their heads, which were doubtless intended as marks of affection, the caterer would fly off. Several individuals, which had not commenced laying their eggs, I saw scratch the sand with their feet, in the manner of the common fowl, while searching for food. In the course of this operation, they frequently seated themselves in the shallow basin to try how it fitted their form, or find out what was still wanted to ensure their comfort. Not the least semblance of a quarrel did I observe between any two of these interesting creatures; indeed, they all appeared as if happy members of a single family; and as if to gratify my utmost wishes, a few of them went through the process of courtship in my presence. The male birds frequently threw their heads over their back as it were, in the manner of several species of Gulls; they also swelled out their throats, walked round the females, and ended by uttering a soft puffing sound as they caressed them. Then the pair for a moment or two walked round each other, and at length rose on wing and soon disappeared. Such is one of the many sights it has been my good fortune to witness, and by each of them have I been deeply impressed with a sense of the pervading power of the Deity.

The Sooty Tern always lays three eggs as its full number, and in no instance, among thousands of the nests which were on the Bird Key, did I find one more when the female was sitting close. I was desirous of ascertaining whether the male and the female incubate alternately; but this I was unable to do, as the birds frequently left their eggs for half an hour or even three quarters at a time, but rarely longer. This circumstance, together with the very slight difference in size and colour between the sexes, was the cause of my failure.

It was curious to observe their actions whenever a large party landed on the island. All those not engaged in incubation would immediately rise in the air and scream aloud; those on the ground would then join them as quickly as they could, and the whole forming a vast mass, with a broad extended front, would as it were charge us, pass over for fifty yards or so, then suddenly wheel round, and again renew their attack. This they would repeat six or eight times in succession. When the sailors, at our desire, all shouted as loud as they could, the phalanx would for an instant become perfectly silent, as if to gather our meaning; but the next moment, like a huge wave breaking on the beach, it would rush forward with deafening noise.

When wounded and seized by the hand, this bird bites severely, and utters a plaintive cry differing from its usual note, which is loud and shrill, resembling the syllables *oo-ee, oo-ee*. Their nests are all scooped near the roots or stems of the bushes, and under the shade of their boughs, in many places within a few inches of each other. There is less difference between their eggs than is commonly seen in those of water birds, both with respect to size and colouring. They generally measure two inches and one-eighth, by one and a half, have a smooth shell, with the ground of a pale cream colour, sparingly marked with various tints of lightish umber, and still lighter marks of purple, which appear as if within the shell. The lieutenant, N. LACOSTE, Esq., informed me that shortly after the young are hatched, they ramble pell-mell over the island, to meet their parents, and be fed by them; that these birds have been known to collect there for the purpose of breeding since the oldest wreckers on that coast can recollect; and that they usually arrive in May, and remain until the beginning of August, when they retire southward to spend the winter months. I could not, however, obtain a sufficiently accurate description of the different states of plumage which they go through, so as to enable me to describe them in the manner I should wish to do. All that I can say is, that before they take their departure, the young are greyish-brown above, dull white beneath, and have the tail very short.

At Bird Key we found a party of Spanish eggers from Havana. They had already laid in a cargo of about eight tons of the eggs of this Tern and the Noddy. On asking them how many they supposed they had, they answered that they never counted them, even while selling them, but disposed of them at seventy-five cents per gallon; and that one turn to market sometimes produced upwards of two hundred dollars, while it took only a week to sail backwards and forwards to collect their cargo. Some eggers, who now and then come from Key West, sell their eggs at twelve and a half cents the

dozen; but wherever these eggs are carried, they must soon be disposed of and eaten, for they become putrid in a few weeks.

On referring to my journals once more, I find the following remarks with reference to the Sooty Tern. It would appear that at some period not very remote, the Noddy, *Sterna stolida*, must have had it in contemplation to appropriate to itself its neighbour's domains; as on examination of this island, several thousand nests of that bird were found built on the tops of the bushes, although no birds of the species were about them. It is therefore probable that if such an attempt was made by them, they were defeated and forced to confine themselves to the neighbouring island, where they breed by themselves, although it is only a few miles distant. That such interferences and conflicts now and then occur among different species of birds, has often been observed by other persons, and in several instances by myself, particularly among Herons. In these cases, right or wrong, the stronger party never fails to dislodge the weaker, and keep possession of the disputed ground.

STERNA FULIGINOSA, Bonap. Syn., p. 355.
SOOTY TERN, *Sterna fuliginosa*, Wils. Amer. Orn., vol. viii. p. 145.
SOOTY TERN, Nutt. Man., vol. ii. p. 284.
SOOTY TERN, *Sterna fuliginosa*, Aud. Orn. Biog., vol. iii. p. 263; vol. v. p. 641.

Male, 16¼, 34¾.

From Texas to the Floridas, in spring. Breeds in immense multitudes on the Tortugas. Migratory.

Adult Male.

Bill longer than the head, strong, slender, nearly straight, compressed, very acute. Upper mandible with the dorsal line slightly arched, the ridge broad and convex at the base, narrowed towards the end, the sides convex, the edges sharp and inflected, the tip acute. Nasal groove extended to beyond half the length of the bill, slightly inflected towards the edge; nostrils basal, linear, direct, pervious. Lower mandible with the angle very narrow, acute, extending to a little beyond the middle, the dorsal line straight, the sides convex, the sharp edges inflected, the tip very acute.

Head of moderate size, oblong, compressed; neck of moderate length; body slender; feet very small, wings and tail very long. Tibia bare for a short space; tarsus very short, slender, roundish, covered anteriorly with small scutella, laterally and behind with reticulated rather indistinct scales; toes small, slender, the first very small, the third longest, the fourth nearly as long, the second much shorter, all scutellate above, the anterior united by reticulated webs, having an incurved margin; claws curved, compressed,

acute, that of hind toe smallest, of middle toe by much the largest, and having the inner edge thin and dilated.

Plumage soft, close, blended, very short on the head; the feathers in general broad and rounded. Wings very long, narrow and pointed; primary quills tapering but rounded, the first longest, the rest rapidly graduated; secondary short, broad, rather acute, the inner more tapering. Tail long, very deeply forked, of twelve feathers, of which the outer are tapering, the middle rounded and short.

Bill and feet black. Iris chestnut. Forehead white; lores, upper part of the head, the hind neck and all the upper parts, deep black glossed with blue, excepting the edges of the wings and the lateral tail-feathers, which are white, the latter with the inner web towards the end dusky. All the lower parts and the sides of the neck are pure white.

Length to end of tail 16¼ inches, to end of wings 15⅝, to end of claws 11½; extent of wings 34¾; wing from flexure 12; tail to the end 7¾, to the fork 3⅜; bill along the ridge 1⅜, along the edge of lower mandible 2$\frac{5}{12}$; tarsus $\frac{1}{12}$; middle toe $\frac{9}{12}$, its claw $\frac{4}{12}$.

The Female is similar to the male.

Female. The mouth is formed as in the Cayenne Tern; its width 8½ twelfths. Tongue 1 inch 4 twelfths long, emarginate and papillate at the base, very slender, channelled above, horny beneath, tapering to a point. Œsophagus 6¾ inches long, 1 inch wide at the commencement, 9 twelfths along the neck, but within the thorax dilated into an enormous sac 1 inch 9 twelfths in width. Stomach exceedingly small, being only 10½ twelfths long, 7 twelfths broad; its muscles very thin, the epithelium strong, longitudinally rugous, and of a bright red colour. The belt of the proventricular glands only 3 twelfths in breadth. The walls of the œsophagus are extremely thin, so as to be membranous and transparent. Lobes of liver 1 inch 9 twelfths, and 1 inch 2 twelfths long; gall-bladder ½ inch long, 3 twelfths broad. Intestine 15 inches long, 3 twelfths broad at the commencement, diminishing to 2 twelfths; cœca 1 inch 2 twelfths long, their greatest width 1½ twelfths, at the base only ¾ twelfth; in form and proportion they are thus like those of the genus *Lestris*; their distance from the extremity 2 inches, cloaca globular, 9 twelfths in diameter.

Trachea 4 inches long, from 2½ twelfths to 1½ twelfths in breadth, roundish, the rings 95, unossified. Bronchi very wide, of 28 rings. Muscles as in the other species.

Common Tern?

Male Spring Plumage

Drawn from Nature by J.J.Audubon,F.R.S.F.L.S.

Lith.ed Printed & Col.d by J.T.Bowen Philad.a

COMMON TERN

STERNA HIRUNDO, *Linn.*

PLATE CCCCXXXIII.—ADULT MALE.

Although the Prince of MUSIGNANO has thought that the bird named the Common Tern in America differs from that bearing the same name in Europe, and has in consequence changed its appellation to that of Wilson's Tern, I am of opinion that no difference exists between the Common Terns of the two Continents. The cry of both is besides precisely similar, so that with me there is no doubt whatever as to their identity. Experience has shewn me that the markings or white spots on the primary quills of Gulls, at one time assumed as a criterion by which species might be distinguished, cannot in the least be depended on, varying, as they always do, in individuals of the same species, at almost each successive moult. Then why, reader, should not Terns exhibit analogous changes? The fact is, they do so; and it is almost impossible, on closely inspecting a dozen or more specimens procured at the same period, in either country, to find two individuals exactly corresponding in every particular. Some have the bill almost entirely black, while others have it more or less red and black, and tipped with yellow. The length of the tail-feathers, that of the tarsus, and the size of the interdigital membranes, are all found to differ in some degree, if minutely compared. If species are to be founded on such slight differences, an ample field is open to those who are ambitious of being discoverers. At all events, I cannot help remarking here that it seems to me improper to impose new names on objects, until it is proved by undeniable facts that they present permanent differences.

I have observed this species along the Atlantic coast of North America, from Galveston Island in Texas to the Straits of Belle Isle on the coast of Labrador, both in spring and in early autumn. But when on the islands in Galveston Bay, in the month of April, I saw only a few arriving there from the west; whereas, in the beginning of May great numbers arrived there from the east, settled at once, and commenced breeding. I felt convinced that the numbers which came from the direction of the Floridas were much greater than those which arrived from the westward, and judged it probable that vast numbers had at the same time left the Peninsula on their way

northward. Should other travellers observe the same or similar phenomena at the season mentioned, it will be proved that this species does not extend its autumnal migration so far as several others, which I observed arriving at Galveston Island from the south-west, for example, the Least Tern, *Sterna minuta*, the Cayenne Tern, *St. cayana*, and the Black Tern, *St. nigra*.

The Common Tern commences breeding on the coast of our Middle Districts about the 5th of May. On my voyage to Labrador, I found its eggs on the islands in the Gulf of St. Lawrence, and especially on the Magdalene Islands, which I visited on the 11th of that month. On the 18th I saw them in great abundance in the neighbourhood of American Harbour, on the coast of Labrador, where thousands of Terns were plunging headlong after shrimps all round us. In that country, their eggs were deposited among the short grass, and the places which they occupied were but slightly scratched; whereas, on the Magdalene Islands, where they breed on sandy ridges, slight hollows were scooped out, as is generally the case along the eastern coast of the United States. Their sojourn in Labrador is of short duration; and when we were at Newfoundland, on the 14th of August, multitudes were already passing southward. At the same period considerable numbers pass by an inland route from the Canadas, and all our great lakes, travelling along the Ohio and Mississippi. While residing at Henderson, and afterwards at Cincinnati, I had ample opportunities of watching their movements in the month of September. And yet, you will think it strange, that, during their vernal migration, I never saw one ascend any of these rivers or the streams connected with them. Perhaps the inferior temperature of the waters, compared with those of the ocean, in the early spring months, may induce them to abandon their route at that season. In autumn, on the contrary, when these rivers are heated and reduced in size, the Terns may find in them an abundant supply of the fry of various fishes. It would thus appear, being corroborated by other observations which I have made relative to migration, that species whose range is extensive, are determined in their movements by a genial temperature and an abundant supply of food.

With an easy and buoyant flight, the Tern visits the whole of our indented coasts, with the intention of procuring food, or of rearing its young, amidst all the comforts and enjoyments which kind Nature has provided for it. Full of agreeable sensations, the mated pair glide along side by side, as gaily as ever glided bridegroom and bride. The air is warm, the sky of the purest azure, and in every nook the glittering fry tempts them to satiate their appetite. Here, dancing in the sunshine, with noisy mirth, the vast congregation spreads over the sandy shores, where, from immemorial time, the species has taken up its temporary abode. They all alight, and with minced steps, and tails carefully raised so as not to be injured by the sand,

the different pairs move about, renew their caresses, and scoop out a little cavity in the soil. If you come again in a few days, you will find the place covered with eggs. There they lie, three in each hollow, beautifully spotted and pointed; and as they receive heat enough from the sun, the birds have left them until evening. But not absent are they from the cherished spot, for they have seen you, and now they all fly up screaming. Although unable to drive you away, they seem most anxiously to urge your departure by every entreaty they can devise; just as you would do, were your family endangered by some creature as much stronger than yourself as you are superior to them. Humanity fills your heart, you feel for them as a parent feels, and you willingly abandon the place. The eggs are soon hatched; the young in due time follow their parents, who, not considering their pleasant labour ended when they are able to fly, feed them on wing in the manner of Swallows, until they are quite capable of procuring their subsistence themselves. So soon as this is the case, the young birds fly off in bands, to seek on distant shores, and in sunny climes, the plentiful food which the ocean yields.

The nest of the Common Tern is, as I have said, a mere hollow made in the loose sand of some island or mainland beach, scantily tufted with wiry grass, or strewed with sea-weeds. Their eggs never exceed three in number; their average length is 1 inch 5½ eighths, their breadth 1¼ inches. They vary greatly in their markings, as is the case with those of all the smaller species of this family; but their ground colour is generally pale yellowish-green, blotched and spotted with brownish-black and purplish-grey or neutral tint.

The young, which are fed with small fishes, shrimps, and insects, separate from the old birds when fully fledged, and do not again associate with them until the following spring, when both are found breeding in the same places. It seems quite curious to see these young birds in winter, during boisterous weather, throwing themselves into the remotest parts of estuaries, and even visiting salt-water ponds at some distance from the sea, as I have often seen them do at Charleston, in South Carolina, when accompanied by my friend the Rev. Dr. BACHMAN. Their plumage is then so very different from that of the old birds, that one might readily believe them to be of another species, did he not observe that their mode of flying and their notes are the same. Not less strange is it, that on such occasions none of the old birds are to be seen in the place, they having remained, braving the fury of the tempest, on the outer harbours. In the beginning of winter, young birds also sometimes ascend the Mississippi as far as Natchez; and in the same manner betake themselves to all the large lakes bordering the Gulf of Mexico. There, as well as elsewhere, you see them plunge into the water,

and instantaneously secure their prey, rise as quickly, and dash into another spot hard by, whenever food happens to be abundant.

I have many times seen the Common Tern suddenly fly up and come close over a man or a dog, without the least apparent provocation, indeed when far distant from its nest, and then pass and repass repeatedly within a few yards, emitting a plaintive cry, as if its eggs or young were in the immediate vicinity. At other times, when the birds were yet distant from their young, and carrying fish in their bills, they would, on seeing a man, round to, drop their food, and perform the same evolutions. I, however, know nothing more remarkable of this species of Tern, than that it should breed, as I know from personal observation to be the case, along the whole of our Atlantic coast, in suitable places, from Texas to Labrador.

When travelling in stormy weather, they skim over the surface of the water, moving rapidly and close together; whereas in fine weather, they rise high, and proceed in a straggling manner. Now and then I have seen them alight among Tringas of different species, as well as among Razor-billed Shearwaters, on outward sand beaches.

GREAT TERN, *Sterna Hirundo*, Wils. Amer. Orn., vol. viii. p. 76.
STERNA HIRUNDO, Bonap. Syn., p. 354.
STERNA HIRUNDO, *Great Tern*, Swains. and Rich. F. Bor. Amer., vol. ii. p. 412.
GREAT or COMMON TERN, Nutt. Man., vol. ii. p. 271.
COMMON TERN, *Sterna Hirundo*, Aud. Orn. Biog., vol. iv. p. 74.

Male, 16, 31½.

Breeds from Galveston Island along the shores of the Atlantic to Labrador, and as far north as lat. 57°. Returns southward in autumn, passing beyond Texas. Extremely abundant.

Adult Male.

Bill about the same length as the head, rather slender, compressed, nearly straight, tapering to a narrow point. Upper mandible with the dorsal line slightly arched, the ridge rather broad and convex at the base, narrow towards the end, the sides sloping, convex towards the end, the edges sharp and inflected, the tip very slender. Nasal groove rather long, and with a faint groove and ridge extending obliquely to the edge of the mandible; nostrils sub-basal, linear, direct, pervious. Lower mandible with the angle very narrow, extending beyond the middle, the dorsal line straight, the sides ascending and convex, the edges sharp and inflected, the tip very acute.

Head of moderate size, oblong; neck of moderate length; body very slender. Feet very small; tibia bare for a considerable space; tarsus very short, slender, compressed, covered anteriorly with twenty-two small scutella, laterally and behind with reticular scales; toes very small, slender, the first

extremely small, the third longest, the fourth considerably shorter, the second shorter than the fourth in the same proportion; the anterior toes connected by reticulated webs, which are deeply concave at their margin. Claws arched, compressed, that of the hind toe smallest, of the middle by much the largest, and having the inner edge thin and dilated.

Plumage soft, close, blended, very short on the fore part of the head; the feathers, in general, broad and rounded; wings very long, narrow, and pointed; primary quills tapering to a rounded point, slightly curved inwards, the first longest, the rest rapidly graduated; secondary quills short, broad, incurved, obliquely rounded, the inner more tapering. Tail long, very deeply forked, of twelve feathers, of which the outer are tapering, the middle short and rounded.

Bill bright coral-red, black towards the end, the tip light yellow; inside of mouth reddish-orange; eye hazel. Feet coral-red, lighter than the bill; claws brownish-black. Upper part of the head, and the hind neck half-way down, deep black, the anterior part tinged with brown, the posterior with blue. The sides of the head, the fore neck, and all the lower parts, white, with a slight tinge of greyish-blue on the breast. Back, scapulars, and wings, light greyish-blue, the edges of the wings, the rump, and upper tail-coverts, white, slightly tinged with grey. First primary with the outer web deep black, the shaft white, on the inner web a greyish-black band running along the shaft, narrow at the base, and widening so as to occupy the whole breadth of the web for an inch at the end, where it is hoary. The next five have the outer web, and a varying portion of the inner, in nearly their whole length hoary, but at the same time with a dusky shade, which becomes more apparent at the ends; the rest of the quills are like the back, but margined and tipped with white. Tail-feathers with the inner webs white, the outer webs of the colour of the back, paler on the middle feathers, gradually deepening outwards, and on the outer feathers dark or blackish-grey.

Length to end of tail 16 inches, to the fork of the tail 11, to end of wings $15\frac{8}{8}$, to end of claws $11\frac{1}{4}$; extent of wings $31\frac{1}{2}$; wing from flexure $11\frac{3}{12}$; tail to end of lateral feathers $7\frac{1}{12}$, to fork $3\frac{1}{12}$; bare part of vibia $\frac{6}{12}$; tarsus $\frac{10}{12}$; hind toe and claw $\frac{3}{12}$, middle toe and claw $1\frac{1}{12}$. Weight 5 oz.

The Female is similar to the male, but rather smaller. In some instances I have seen a small portion of the forehead white.

Length to end of tail 15 inches, to the fork $11\frac{1}{2}$, to end of wings $15\frac{1}{4}$, to end of claws 11; extent of wings $30\frac{1}{4}$; wing from flexure $10\frac{1}{2}$. Weight 5 oz.

The Young in their first plumage have the bill dull greenish-black, with the tip yellowish; the feet greenish-yellow.

In winter, the bill is black, with the base pale orange, and the tip yellow-

ish; the feet orange-yellow. The colours are as in the adult, the forehead white, the rest of the head dusky, the upper parts having the feathers slightly margined with lighter.

Length to end of tail 12¾, to the fork 11; to end of wings 14, to end of claws 10½; extent of wings 29¼; wing from flexure 8¼.

American and British specimens present no essential differences when compared in considerable numbers. The outer web of the lateral tail-feather is blackish-grey, and the inner webs of the tail-feathers are white in all the specimens collected for comparison. The tarsus in American specimens varies in length from 9 to 10½ twelfths, and the claw of the middle toe from 2½ to 4½ twelfths; but similar differences are observed in the British birds.

The tongue is 1 4 inches long, sagittate and papillate at the base, very slender, tapering, the point slit, the upper surface a little concave, the lower horny towards the end. Aperture of posterior nares linear, 9 twelfths long. Palate with a middle and two lateral ridges. Œsophagus 6 inches long, extremely wide, its average diameter on the neck 7 twelfths, within the thorax 11 twelfths. The stomach is muscular, 1 inch long, the lateral muscles not distinguishable, the fasciculi of fibres being disposed as in the rapacious birds; the central tendinous spaces 3 twelfths in diameter; the cuticular lining strong, with broad longitudinal rugæ. The contents of the stomach, fishes. The proventriculus 1 inch long. Intestine 1 foot 7 inches long, of moderate diameter, convoluted, varying from 2¾ twelfths to 2½ twelfths. Rectum 1 inch long. Cœca 5 twelfths long, with a diameter of ¾ of a twelfth.

The trachea is 3¾ inches long, 2½ twelfths in breadth above, 1½ twelfths below; its rings 103, feeble and unossified; the lateral muscles extremely slender; there are sterno-tracheal muscles, but none besides. Bronchial half-rings about 18.

Havells Tern?

Adult.

Drawn from Nature by J.J.Audubon F.R.S.F.L.S.

Lith.ed Printed & Col.d by J.T. Bowen. Phila.a

HAVELL'S TERN.

STERNA HAVELLII, *Aud.*

PLATE CCCCXXXIV.—ADULT.

I have several reasons for naming this Tern after Mr. ROBERT HAVELL, of Oxford Street, London. In the first place I consider him as one of the best ornithological engravers in England. Secondly, I feel greatly indebted to him for the interest which he has always evinced in my publication, which, I dare venture to assert, is the largest work of the kind that has hitherto appeared, and the engraving of which has cost him much trouble and anxiety. Thirdly, I consider myself entitled to express my gratitude in this manner, the individual on whom I confer the honor being more deserving of it than many to whom similar compliments have been paid.

I shot several individuals of this species out of a number congregated on the broad eddies opposite New Orleans, in 1820. They were engaged in picking up floating coleopterous insects; but after I had fired several shots, and was rowing to those which had fallen on the water, the rest flew off. Since that time it had not been my fortune to meet with any birds of the same species, until I visited Texas in the spring of 1837, when two of them were procured.

HAVELL'S TERN, *Sterna Havellii*, Aud. Orn. Biog., vol. v. p. 122.

Adult, 15½, wing, 10 $\frac{3}{12}$.

From Texas to South Carolina. Common. Migratory.

Adult in winter plumage.

Bill about the length of the head, rather stout, much compressed, acute. Upper mandible with the dorsal line slightly declinato-convex, the ridge convex at the base, very narrow in the rest of its extent, the side sloping at the base, nearly erect and convex toward the end, the edges sharp and inflected, the tip very narrow. Nasal groove rather short, but with a channel surmounted by a ridge running from its anterior part to the edge of the mandible about half an inch from the tip. Lower mandible with the angle very narrow and acute, extending to beyond the middle, the outline of the crura a little concave, that of the rest ascending and straight, a slight pro-

minence or angle being formed at their junction, as in Gulls, the sides erect and slightly convex, the edges sharp and inclinate, the tip acuminate, the gap-line slightly arcuate.

Head of moderate size, ovate; neck of moderate length: body slender. Feet small; tibia bare for seven-twelfths of an inch; tarsus very short, compressed, anteriorly scutellate; toes small, slender; the first extremely small, the third longest, the fourth much longer than the second; all scutellate above, the anterior connected by reticulate webs, of which the inner is more deeply emarginate. Claws moderately arched, compressed, very slender, that of the middle toe much larger, and having its inner edge somewhat dilated.

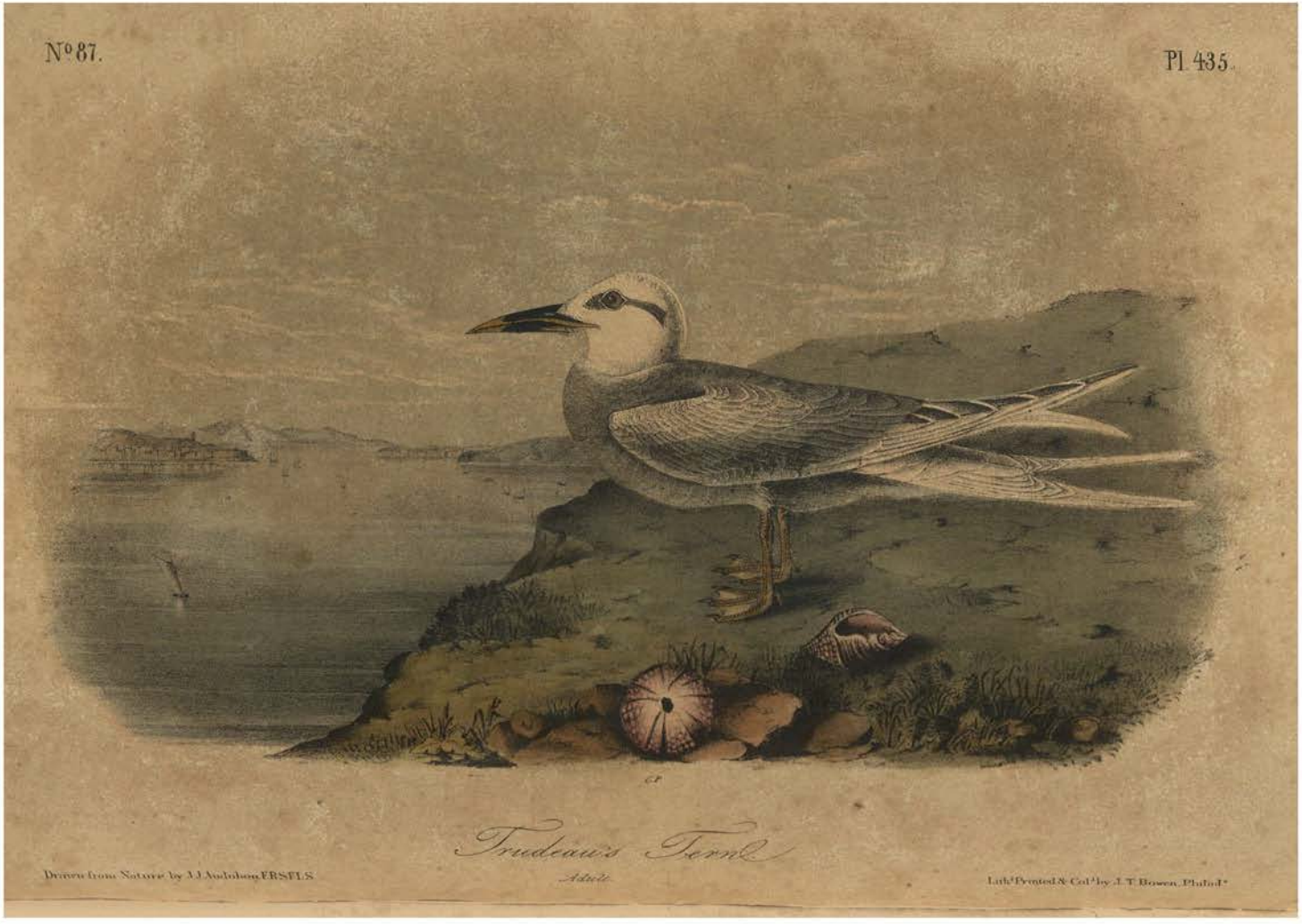
Plumage soft, close, blended, very short on the fore part of the head. Wings very long, narrow, and pointed; primary quills tapering to an obtuse point; the first longest, the second half an inch shorter, the rest rapidly graduated; secondaries short, incurved, obliquely pointed, some of the inner proportionally longer and narrower. Tail of moderate length, deeply forked, of twelve feathers, of which the middle are rounded, and three inches and a quarter shorter than the outer, which taper to a slender point.

Bill black, with the base of the lower mandible tinged with brown, and a very small portion of the tip yellowish. Iris brown. Feet orange-yellow; claws dusky. Surrounding the eye, and extending toward the nape, is a broad band of black; the fore part of the head, the lower eyelid, and all the under parts are pure white; the hind parts of the head and the nape are dusky-grey, mixed with white. The rest of the upper parts are light greyish-blue, excepting the rump, which is white, the primary coverts and quills as well as the tail-feathers and their coverts are hoary, with the shafts white; but five of the quills are dusky on the outer web, on the inner along the shaft, and on the inner margin toward the end.

Length to end of tail 15½ inches; bill along the ridge $1\frac{7}{12}$, along the edge of lower mandible $2\frac{4}{12}$; wing from flexure $10\frac{8}{12}$; tail to end of middle feather $2\frac{8}{12}$, to end of longest feather $6\frac{1}{12}$; tarsus $\frac{11}{12}$; hind toe $\frac{3}{12}$, its claw $\frac{2}{12}$; middle toe $\frac{9}{12}$, its claw $\frac{4}{12}$.

This species differs from the Marsh Tern, *Sterna anglica*, in being less robust, in having the bill a little longer and much more slender, its height at the angle being $\frac{3}{12}$, whereas in that species it is $\frac{4}{12}$; in having the tarsus shorter and much more slender, the feet yellow instead of being black, the claws more slender, and the tail more deeply forked.

The figure in the plate, which is that of an adult bird yet in its winter plumage, has the lateral tail-feathers obliquely truncate, but this was caused by accident, for these feathers in my other specimens run to a narrow point. My specimens from Texas are also in their winter plumage. One of them


No 87.
Pl. 435.
Trudeau's Tern
Adult
Drawn from Nature by J. J. Audubon F.R.S.F.L.S.
Lith^d Printed & Col^d by J. T. Bowen, Phila^d

is coloured as above; but the other is a young bird, which may here be described.

The bill is somewhat shorter and more tinged with brown; the lower parts, the rump, the outer web of the lateral tail-feathers and the sides of the neck are white; the wings as in the adult, but the primaries internally margined with white, and the secondaries tipped with the same; the upper part of the head, and the rest of the upper parts, are light yellowish-brown, intermixed with greyish-blue, and there is the same black band on the side of the head as in the adult.

TRUDEAU'S TERN.

STERNA TRUDEAUII, *Aud.*

PLATE CCCCXXXV.—ADULT.

This beautiful Tern, which has not hitherto been described, was procured at Great Egg Harbour in New Jersey, by my much esteemed and talented friend, J. TRUDEAU, Esq., of Louisiana, to whom I have great pleasure in dedicating it. Nothing is known as to its range, or even the particular habits in which it may differ from other species. The individual obtained was in the company of a few others of the same kind. I have received from Mr. TRUDEAU an intimation of the occurrence of several individuals on Long Island.

TRUDEAU'S TERN, *Sterna Trudeauii*, Aud. Orn. Biog., vol. v. p. 125.

Adult, 16; wing, $10\frac{1}{12}$.

Great Egg Harbour and Long Island. Rare. Migratory.

Adult in winter plumage.

Bill about the length of the head, rather slender, much compressed, acuminate. Upper mandible with the dorsal line slightly declinato-convex, the ridge rather broad and convex at the base, very narrow in the rest of its extent, the sides sloping at the base, nearly erect and convex toward the end, the edges sharp and inflected, the tip very narrow. Nasal groove rather short, but with a slight channel, surmounted by a ridge, running from its

anterior part to the edge of the mandible about three-fourths of an inch from the tip. Lower mandible with the angle long, very narrow, and pointed, the outline of the crura a little concave, that of the rest ascending and straight, a very slight prominence or angle being formed at their junction, the sides erect and slightly convex, the edges sharp and inclinate, the tip acuminate, the gap-line slightly arcuate.

Head of moderate size, ovato-oblong, neck of moderate length; body slender. Feet small; tibia bare for half an inch; tarsus very short, compressed, anteriorly scutellate; toes small, slender; the first extremely small, the third longest, the fourth much longer than the second, all scutellate above, the anterior connected by reticulate webs, of which the inner is more deeply emarginate. Claws moderately arched, compressed, very slender towards the end, that of the middle toe much larger, and having its inner edge somewhat dilated.

Plumage soft, close, blended, very short on the fore part of the head. Wings very long, narrow, and pointed; primary quills tapering to an obtuse point; the first longest, the second half an inch shorter, the rest rapidly graduated; secondaries short, incurved, obliquely pointed, some of the inner proportionally longer and narrower. Tail of moderate length, deeply forked, of twelve feathers, of which the middle are rounded, and three inches shorter than the outer, which taper to a slender point.

Bill black, with part of the base of the lower mandible, the edges of both mandibles, and their tips to the length of five-twelfths of an inch, yellow. Iris brown. Feet orange-yellow; claws dusky-yellow. Surrounding the eye, and extending toward the nape, is a band of blackish-grey; the fore part of the head, the lower eyelid, the cheeks, and the upper part of the throat, are white. The rest of the upper and lower parts are light greyish-blue, excepting the axillar feathers, the lower wing-coverts, and the rump, which are white; the tail-coverts and tail are greyish-white. The primary coverts and quills are hoary, but the outer five are dusky-grey on the inner web, toward the margin, and less so along the shaft, and on the outer web; but the shafts of all the quills and tail-feathers are white, as are the inner edges of the primaries and the tips of the secondaries, the inner excepted.

Length to end of tail 16 inches, to end of wings 15; bill along the ridge $1\frac{8}{12}$, along the edge of lower mandible $2\frac{5}{12}$; wing from flexure $10\frac{10}{12}$; tail to end of middle feather $2\frac{8}{12}$, to end of lateral feather $5\frac{8}{12}$; tarsus $1\frac{4}{12}$; hind toe $\frac{3}{12}$, its claw $\frac{1}{12}$; middle toe $\frac{10}{12}$, its claw $\frac{4}{12}$.

This species has the bill more slender than Havell's Tern, and differently coloured, the tarsus shorter, and the lower parts of the body and neck of the same tint as the upper, whereas that species is white beneath.

It is probable that both species have the upper part of the head and the nape black in summer.

Drawn from nature by J. W. Audubon

Lith. & col. by Bowen & Co. Philad.

Arctic Tern

Male.

THE ARCTIC TERN.

STERNA ARCTICA, *Temm.*

PLATE CCCCXXXVI.—MALE.

Light as a sylph, the Arctic Tern dances through the air above and around you. The graces, one might imagine, had taught it to perform those beautiful gambols which you see it display the moment you approach the spot which it has chosen for its nest. Over many a league of ocean has it passed, regardless of the dangers and difficulties that might deter a more considerate traveller. Now over some solitary green isle, a creek or an extensive bay, it sweeps, now over the expanse of the boundless sea; at length it has reached the distant regions of the north, and amidst the floating icebergs stoops to pick up a shrimp. It betakes itself to the borders of a lonely sand-bank, or a low rocky island; there side by side the males and the females alight, and congratulate each other on the happy termination of their long journey. Little care is required to form a cradle for their progeny; in a short time the variegated eggs are deposited, the little Terns soon burst the shell, and in a few days hobble towards the edge of the water, as if to save their fond parents trouble; feathers now sprout on their wings, and gradually invest their whole body; the young birds at length rise on wing, and follow their friends to sea. But now the brief summer of the north is ended, dark clouds obscure the sun, a snow-storm advances from the polar lands, and before it skim the buoyant Terns, rejoicing at the prospect of returning to the southern regions.

The day after our arrival at the Magdalene Islands, the weather was beautiful, although a stiff breeze blew from the south-west. I landed with my party at an early hour, and we felt as if at a half-way house on our journey from Nova Scotia to Labrador. Some of us ascended the more elevated parts of those interesting islands, while others walked along the shores. A clean sand-beach lay before us, and we proceeded over it, until having reached a kind of peninsula, we were brought to a stand. The Piping Plover ran and flew swiftly before us, emitting its soft and mellow notes, while some dozens of Arctic Terns were plunging into the waters, capturing a tiny fish or shrimp at every dash. Until that moment this Tern had not been familiar to me, and as I admired its easy and graceful motions,

I felt agitated with a desire to possess it. Our guns were accordingly charged with mustard-seed shot, and one after another you might have seen the gentle birds come whirling down upon the waters. But previous to this I had marked their mode of flight, their manner of procuring their prey, and their notes, that I might be able to finish the picture from life. Alas, poor things! how well do I remember the pain it gave me, to be thus obliged to pass and execute sentence upon them. At that very moment I thought of those long-past times, when individuals of my own species were similarly treated; but I excused myself with the plea of necessity, as I recharged my double gun. As soon as a sufficient number of males and females lay dead at our feet, we retired from the water's edge, to watch the motions of the survivors, among whom confusion and dismay prevailed, as they dashed close over our heads, and vociferated their maledictions. We did not, however, depart until we had tried a curious experiment for the third time. A female had been shot, and lay dead on the water for a considerable while. Her mate, whom I was unwilling to destroy, alighted upon her, and attempted to caress her, as if she had been alive. The same circumstance took place three different times, on our throwing the dead bird on the water. Something of the same nature I have related in my article on the Wild Turkey. All this happened in the month of June 1833, when none of the Arctic Terns had yet produced eggs, although we found them nearly ready to lay, as were the Piping Plovers.

Our schooner now sailed onward, and carried us to the dreary shores of Labrador. There, after some search, we met with a great flock of Arctic Terns breeding on a small island slightly elevated above the sea. Myriads of these birds were there sitting on their eggs. The individuals were older than those which we had seen on the Magdalene Islands; for the more advanced in life the individuals of any species are, the more anxious are they to reproduce, the sooner do they proceed to their summer residence, and the more extensive is the range of their migration northward. On the other hand, the younger the bird is, the farther south it removes during winter, both because it thus enjoys a milder climate, and requires less exertion in procuring its food; whereas the older individuals not only have a stronger constitution, but are more expert in discovering and securing their prey, so that it is not necessary for them to extend their journey so far.

The Arctic Tern is found with us on the eastern coasts of the United States only, where it appears, from the shores of New Jersey northwards in autumn, and whence it departs in early spring. No sooner have the winter tempests subsided, than it is observed gliding along the coast, together with many other birds. In the beginning of March, you see it following the sinuosities of the shores, some passing directly from the Sable Islands

off the Bay of Fundy and Newfoundland into Baffin's Bay; others, younger, and unwilling to encounter the perils of a more extended flight, passing up the Gulf of St. Lawrence, either through the Straits of Cansso, or the broader channel between Cape Breton and Newfoundland, and betaking themselves to the Magdalene Islands and the coasts of Labrador.

While at American Harbour in June 1833, my son and some of his companions met with a low rocky island, on which hundreds of these Terns had deposited their eggs. No other species was seen there; the birds were mostly sitting, and, on the landing of the party, they all rose as if in the greatest consternation, hovered over their heads, and left their eggs to the mercy of the intruders, who carried off a basketful of them, with a few of the birds themselves.

On the 18th of the same month, the Arctic Terns were found breeding on another island in considerable numbers; many dozens of their eggs were gathered, and delicious food indeed they proved to be. The full number of their eggs is three, but as it was early in the season many had only two. Their average dimensions were an inch and a quarter in length, and five-eighths in their greatest breadth; they were oval, but rather sharp at the smaller ends; their ground-colour a light olive, irregularly covered with patches of dark umber, larger towards the round end. They were deposited on the rocks wherever there was any grass, but no nest had been formed for their reception. They differed extremely in their colour, indeed quite as much as those of the Sandwich Tern. As we approached the little island, they all rose in the air, and flew high over our heads, screaming loudly, which they continued to do until we left the place. Several were shot, and as each fell the rest immediately plunged through the air after it. Whenever one was wounded so slightly as to be able to make off, it was lost to us, and the rest followed it. Only a very few of those which we saw and shot had the bill entirely red, and those which had were evidently older birds. Some exhibited a considerable portion of the point tinged with brownish-black, yet all of them could easily be distinguished from the *Sterna Hirundo*, first by their smaller size, shorter tarsi, more delicate bill, and greater curvature of the outer part of their wings; and secondly, by the leaden tint of their lower parts, from the neck to the tail, those parts in *Sterna Hirundo* being pure white. The back is also of a deeper blue in the Arctic Tern. The long tail-feathers were much shorter in the females than in the males, but M. Temminck is wrong in saying that this bird has the tail proportionally longer than that of other species, the Roseate Tern having it of much greater length, considering its diminutive size.

At the beginning of the first autumn, the plumage of the young so much resembles that of the young of *Sterna Hirundo*, that a person, not paying

attention to the tarsi and feet, might readily confound them together. Yet even at this early age, there are strong indications of the bluish tint on the under parts. The longest tail-feathers at this period do not extend more than two inches beyond the rest; the upper parts of the body are mottled with brown, as in all the other species, and in Gulls. The mantle of this, as of all other Terns, assumes its permanent hue before any part of the wings. On the 5th of August, in Labrador, the young birds were gambolling along with their parents, over the shores of Bras d'Or Harbour, and when we left that country the Terns still remained, so that I am unable to state at what particular period they commence their journey southward.

The notes of this species resemble the syllables *creek, creek*, and are often repeated while the bird is on wing. During autumn it follows the sinuosities of the shores of the bays and inlets, ascending against the ebb, and returning to meet the tide, which enables it to procure its food in succession while it keeps on its course. I have only farther to mention a curious fact, which is, that all the Terns which breed in the northern parts of the United States, and in regions still nearer the pole, sit closely on their eggs, while the small species that breed to the southward incubate only during night, or in rainy weather.

STERNA ARCTICA, Bonap. Syn., p. 354.
STERNA ARCTICA, *Arctic Tern*, Swains. and Rich. F. Bor. Amer., vol. ii. p. 414.
ARCTIC TERN, Nutt. Man., vol. ii. p. 275.
ARCTIC TERN, *Sterna arctica*, Aud. Orn. Biog., vol. iii. p. 366.

Male, 15½, 32.

Along the coast of the Atlantic in autumn and winter, sometimes as far as New Jersey. Common in Maine, Nova Scotia, and Labrador, where it breeds in multitudes, as well as on the Magdalene Islands, and on the shores of the Arctic Seas. Migratory.

Adult Male in spring.

Bill about the same length as the head, slender, tapering, compressed, nearly straight, very acute. Upper mandible with the dorsal line slightly arched, the ridge rather broad and convex at the base, narrow towards the end, the sides convex, the edges sharp and inflected, the tip acute. Nasal groove extended beyond the nostrils nearly to the tip; nostrils basal, linear, direct, previous. Lower mandible with the angle extremely narrow, very acute, extending beyond the middle, the dorsal line straight, the sides erect and slightly convex, the sharp edges inflected, the tip extremely acute.

Head of moderate size, oblong; neck of moderate length; body very slender. Feet very small; tibia bare for a considerable space; tarsus

extremely short, slender, roundish, covered anteriorly with small scutella, laterally and behind with reticular scales ; toes very small, slender, the first extremely small, the third longest, the fourth nearly as long, the second much shorter, all scutellate above, the anterior connected by reticulated webs having a concave margin ; claws arched, compressed, acute, that of hind toe smallest, of middle toe by much the largest, and having the inner edge thin and dilated.

Plumage soft, close, blended, very short on the fore part of the head ; the feathers in general broad and rounded. Wings very long, narrow, and pointed ; primary quills tapering, slightly curved inwards, the first longest, the rest rapidly graduated ; secondary short, broad, incurved, rounded, the inner more tapering. Tail long, very deeply forked, of twelve feathers, of which the outer are tapering, the middle short and rounded.

Bill, mouth, and feet, vermilion tinged with carmine. Iris brown. The upper part of the head and elongated occipital feathers greenish-black ; the sides of the head and chin white ; the upper parts pale greyish-blue, the rump lighter, the tail white, excepting the outer webs of the two lateral feathers which are dusky-grey ; primaries dusky towards the ends, the two outer with their outer webs blackish, all with the greater part of the inner web white ; secondaries tipped with white. Neck, breast, and sides pale greyish-blue, like the upper parts, but lighter ; abdomen, under tail-coverts, and lower surfaces of wings and tail white.

Length to end of tail 15½ inches, to end of wings 13½, to end of claws 9¾ ; extent of wings 32 ; wing from flexure 10½ ; tail to end of shortest feathers 3¼, to end of longest 7½ ; bill along the ridge 1¼, along the edge of lower mandible 1$\frac{10}{12}$; tarsus $\frac{9}{12}$; middle toe $\frac{8}{12}$, its claw $\frac{3}{12}$. Weight 2¾ oz.

THE ROSEATE TERN.

STERNA DOUGALLII, *Mont.*

PLATE CCCCXXXVII.—ADULT.

On the 28th of April, 1832, it was my lot to be on the beautiful rocky islet named Indian Key, where I spent a few hours of the night in unsuccessful attempts to procure repose, which was effectually banished by the consciousness of my being in a portion of the country not yet examined by any industrious student of nature, and in which I expected to find much that would prove interesting. The rain fell in torrents, and the rattling of the large drops on the shingles of the veranda in which my hammock had been slung, together with the chillness of the air, contributed to keep me awake. Finding it useless to remain in bed, I roused my companions; it was just four o'clock, and in a few minutes all the people in the house were up, and breakfast preparing. Before six the rain abated, and as I was determined not to lose a day, the guns were mustered, we made our way to the boats, and pushed off through a gentle shower in quest of unknown birds! In about an hour the rain ceased, the sky gradually cleared, and the sun soon dried our clothes. About this time we observed a great number of Terns on a sand bar, which we approached. The birds were not shy, so that we obtained an opportunity of firing two guns at them, when we leaped out, and on wading to the shore picked up thirty-eight Roseate Terns and several of another species.

Beautiful, indeed, are Terns of every kind, but the Roseate excels the rest, if not in form, yet in the lovely hue of its breast. I had never seen a bird of this species before, and as the unscathed hundreds arose and danced as it were in the air, I thought them the Humming-birds of the sea, so light and graceful were their movements. Now they flocked together and hovered over us, again with a sudden dash they plunged towards us in anger; even their cries of wrath sounded musical, and although I had carried destruction among them, I felt delighted. As I have just said, I had not before seen a Roseate Tern, not even the skin of one stuffed with tow; the species was not in the Synopsis of my friend BONAPARTE, and now I had my cap filled to the brim with specimens. You may rest assured that I took precious care of those which I had procured, but not another individual was robbed of life

Light House, St. John, New Brunswick

Roseate Tern.

Male

Drawn from Nature by J.J. Audubon, F.R.S.F.L.S.

Lith. & Col.d by Bowen & Co, Philad.a

on that excursion. The other Terns were as new to me. I observed the form of their black bill and feet, the yellow tip of the former, and wrapped them up with care, while I tried to recollect the name they bore in books. To have found hundreds of the Roseate Tern in the Floridas, while I had anxious but slender hopes of meeting it on the coast of Labrador, was to me quite astonishing. So it was, however, and I determined to ransack every key and sand-beach, to try to find its breeding-ground. Nor were my desires ungratified.

The Roseate Tern spends the breeding season along the southern shores of the Floridas in considerable numbers. At different times in the course of nearly three months which I spent among the keys, I saw flocks of twenty, thirty, or more pairs, breeding on small detached rocky islands, scantily furnished with grass, and in the company of hundreds of Sandwich Terns. The two species appeared to agree well together, and their nests were intermingled. The full number of eggs of the present species is three. They differ considerably in size and markings ; their average length, however, is an inch and three quarters, their breadth an inch and one-eighth ; they are of a longish oval shape, rather narrowed at the small end, of a dull buff or clay colour, sparingly sprinkled and spotted with different tints of umber and light purple. They were deposited on the bare rocks, among the roots of the grasses, and left in fair weather to the heat of the sun. Like those of the Common Tern and other species, they are delicious eating. The eggs of the Sandwich Tern were more attended to during the day, but towards night both species sat on their eggs. I did not see any of the young, but procured a good number of those of the preceding year, which kept apart from the old birds, but had in all respects the same habits.

The Roseate Tern is at all times a noisy, restless bird ; and on approaching its breeding place, it incessantly emits its sharp shrill cries, resembling the syllable *crāk*. Its flight is unsteady and flickering, like that of the Arctic or Lesser Tern, but rather more buoyant and graceful. They would dash at us and be off again with astonishing quickness, making great use of their tail on such occasions. While in search of prey, they carry the bill in the manner of the Common Tern, that is perpendicularly downward, plunge like a shot, with wings nearly closed, so as to immerse part of the body, and immediately re-ascend. They were seen dipping in this manner eight or ten times in succession, and each time generally secured a small fish. Their food consisted of fishes, and a kind of small molluscous animal which floats near the surface, and bears the name of "sailor's button." They usually kept in parties of from ten to twenty, followed the shores of the sand-bars and keys, moving backwards and forwards much in the manner of the Lesser

Tern, and wherever a shoal of small fish was found, there they would hover and dash headlong at them for several minutes at a time.

The wreckers informed me that this species returns regularly to these islands each spring, about the 10th of April, and goes off southward early in September. These birds, with their favourite companions the Sandwich Terns, habitually resorted to the sand-bars each day, to rest for an hour or two. I have never seen them on any part of our middle or eastern coast, and am of opinion that they rarely proceed farther eastward than the Capes of Florida, and that they are more attached to the immediate vicinity of the shores than the larger species, which more generally fly out to some distance. The delicate and beautiful rosy tint of the breast soon fades after death. Those specimens which were not skinned immediately after being procured did not retain it for a week, and in none of them was it perceptible, without separating the feathers, at the end of a month. In winter it disappears, as well as the glossy black of the head. The length of the outer tail-feathers varies considerably; but I could perceive no decided difference of size or colour in the sexes, although I thought the females somewhat smaller than the males.

STERNA DOUGALLII, Mont. Temm.
ROSEATE TERN, Nutt. Manc., vol. ii. p. 278.
ROSEATE TERN, *Sterna Dougallii*, Aud. Orn. Biog., vol. iii. p. 296.

Male, 14½, 30.

Florida Keys, where it is abundant, and breeds. Migratory.

Adult Male.

Bill longer than the head, slender, tapering, compressed, nearly straight, very acute. Upper mandible with the dorsal line slightly arched, the ridge rather broad and convex at the base, narrow towards the end, the sides convex, the edges sharp and inflected, the tip acute. Nasal groove short, extended to one-third of the length of the bill deflected towards the edge; nostrils basal, linear, direct, pervious. Lower mandible with the angle extremely narrow, very acute, extending to a little beyond the middle, the dorsal line straight, the sides convex, the sharp edges inflected, the tip extremely acute.

Head of moderate size, oblong; neck of moderate length; body very slender; feet small; wings and tail very long. Tibia bare for a considerable space; tarsus very short, slender, roundish, covered anteriorly with small scutella, laterally and behind with reticular scales; toes small, slender, the first very small, the third longest, the fourth nearly as long, the second much shorter, all scutellate above, the anterior united by reticulated webs having

a concave margin; claws curved, compressed, acute, that of hind toe smallest, of middle toe by much the largest, and having the inner edge thin and dilated.

Plumage soft, close, blended, very short on the head; the feathers in general broad and rounded. Wings very long, narrow, and pointed; primary quills tapering, the first longest, the rest rapidly graduated; secondary short, broad, incurved, rounded, the inner more tapering. Tail long, very deeply forked, of twelve feathers, of which the outer are tapering, the middle short and rounded.

Bill brownish-black, deep orange at the base. Iris brown. Feet vermilion; claws blackish-brown yellow at the base. The upper part of the head and elongated occipital feathers greenish-black; the hind neck white, the rest of the upper parts pale bluish-grey, the tail lighter; the edges of the wings, the tips and inner edges of the quills, and the shafts white. The first primary is black on the outer web and part of the inner, the next two are similarly marked, but with the black shaded over with pale grey, the loose barbules being of that colour; the other primaries become gradually lighter. The lower parts are of a beautiful light roseate hue, which soon fades after death; the under surface of wings and tail white.

Length to end of tail 14$\frac{1}{12}$ inches, to end of wings 12, to end of claws 9$\frac{4}{12}$; extent of wings 30; wing from flexure 9$\frac{1}{2}$; tail to end of shortest feathers 4$\frac{3}{4}$, to end of longest feathers 7$\frac{1}{2}$; bill along the ridge 1$\frac{1}{2}$, along the edge of lower mandible 2$\frac{1}{12}$; tarsus $\frac{9}{12}$; middle toe $\frac{9}{12}$, its claw $\frac{3}{2}$.

THE BLACK TERN.

STERNA NIGRA, *Linn.*

PLATE CCCCXXXVIII.—ADULT MALE AND YOUNG.

The Black Tern begins to arrive from the Mexican territories over the waters of the Western Country about the middle of April, and continues to pass for about a month. At that season I have observed it ascending the Mississippi from New Orleans to the head waters of the Ohio, then cutting over the land, and arriving at the Great Lakes, beyond which many proceed still farther northward. But I have rarely met with them along our Atlantic shores until autumn, when the young, which, like those of all other Terns with which I am acquainted, mostly keep by themselves until spring, make their appearance there. Nor did I see a single individual when on my way to Labrador, or during my visit to that country. They re-appear in the Western Country, in the course of their southern migration, in the months of September and October ; but many pairs breed in the intermediate range.

When residing at Louisville in Kentucky, I found the Black Tern abundant in the neighbourhood, breeding on the margins of ponds at a short distance from the Ohio. I also found them with nests and eggs on a pond near Vincennes, in the State of Indiana. Now, however, they have abandoned those places, and merely pass over the country on their way to and from the northern regions.

Often have I watched their graceful, light and rapid flight, as they advanced and passed over in groups of twenty, thirty or more, from the delightful residence of my worthy friend and kind relative NICHOLAS BERTHOUD, Esq. of Shippingport, during the month of May, when Nature, opening her stores anew, benignly smiled upon the favoured land of Kentucky. The gay birds were seen ranging from the basin at the foot of the rapids to the lower part of the narrow channel which separates Sandy Island from the shore, up the clear stream and down again, plunging at short intervals into the water to seize their prey, and continuing their pleasing occupations through the whole day. When the period of reproduction arrived, they would all betake themselves to the ponds, and search along their moist shores for tufts of rank grass such as might form suitable places for their nests. One of their favourite ponds still remains in part, although a great

Black Tern?

1. Adult. 2. Young.

Drawn from Nature by J.J. Audubon, F.R.S.F.L.S.

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portion of it has been drained. It is now known by the name of Hope-Distillery Pond, and lies a few hundred yards from the Ohio, but is nearly surrounded with buildings of various kinds. ALEXANDER WILSON, to whom I showed the old nests of the Black Tern at this place, did not seem to be acquainted with the bird, and thought that they were those of some species of Rail.

The nest is usually placed on the top of a broken tussock of the rankest grasses, of which it is itself composed, it being of a flattish form, and about two inches thick. It is enlarged or renewed every year, some nests being found to be from four to six inches in height. In some instances the water surrounds the foot of the tussock on which it is placed. They begin to lay on the first days of June. The eggs, of which the full number is four greatly resemble in colour those of the Sandwich and Arctic Terns. When disturbed at this season, these birds are as noisy as any of the tribe; but they remain close over the place, and go to the river only at intervals to procure food. Both sexes incubate by turns, and the eggs are kept constantly covered. They average in length one inch and three-eighths, by one inch across, and are nearly of an elliptical form, being but slightly pointed at one end; their ground-colour is greenish-buff, spotted and dashed with reddish umber and black, more abundantly toward the middle. I took the trouble of counting the number of nests around the pond, and found it more than seventy. About the middle of August the young fly well, and are able to seek food for themselves. I have seen the parent birds feed them on wing in the manner of swallows.

They alight less frequently on the water than the larger species. On shore they walk like Swallows. During autumn they hunt for food over the wet prairies, passing low, and picking up the insects as they proceed without alighting. At this season, both old and young have become more silent. They are at all times less shy than most others of the tribe. Their principal food consists of aquatic insects and small fry, and their flesh is tolerably good.

Since I wrote the above notice, I have been informed by my youngest son that this species was still seen about the Falls of the Ohio, in considerable numbers, a few years ago; but that, although he observed them there in spring, summer, and early autumn, he did not discover their breeding grounds, which are perhaps now farther inland than formerly.

STERNA NIGRA, Bonap. Syn., p. 355.
STERNA NIGRA, *Black Tern*, Swains. and Rich. F. Bor. Amer., vol. ii. p. 415.
BLACK TERN OR STERN, Nutt. Man. vol. ii. p. 282.
BLACK TERN, *Sterna nigra*, Aud. Orn. Biog., vol. iii. p. 535; vol. v. p. 642.

Adult, 9, 24. Young, in autumn, 7¾; wing, 9$\frac{8}{12}$.

Arrives in Texas from the south early in spring, proceeds along the coast to the Mississippi, then ascends that river and its tributaries, breeding around ponds, or along the streams; and even advances to the Fur Countries, where it also breeds. Abundant. Migratory. Occasionally along the coasts of the Middle Atlantic Districts.

Adult Male.

Bill about the same length as the head, slender, tapering, compressed, nearly straight, very acute. Upper mandible with the dorsal line slightly arched, the ridge convex at the base, narrowed towards the end, the sides sloping at the base, slightly convex and nearly perpendicular towards the tip, the edges sharp, the tip acute. Nasal groove reaching nearly to the middle of the mandible; nostrils basal, linear, direct, pervious. Lower mandible with the angle very narrow, acute, extending beyond the middle, the dorsal line straight, the sides erect and slightly convex, the edges sharp and slightly inflected, the tip extremely acute.

Head of moderate size, oblong; neck rather short; body slender. Feet small; tibia bare for a short space; tarsus very short, covered anteriorly with small scutella, laterally and behind with reticular scales; toes very slender, the first extremely small, the third longest, the fourth nearly as long, the second much shorter, all scutellate above, the anterior connected by short reticulate webs, having a concave margin, and not extending much beyond the middle of the toes. Claws long, slender, arched, compressed, acute, that of hind toe smallest, of middle toe largest, and having a thin dilated inner edge.

Plumage soft, close, blended, on the head short, on the back somewhat compact. Wings very long, narrow and pointed; primary quills tapering, the outer slightly curved inwards at the end, the first longest, the rest rapidly graduated; secondary short, broad, incurved, rounded. Tail of moderate length, emarginate, of twelve rounded feathers.

Bill brownish-black. Iris brown. Feet reddish-brown, claws black. Head, neck, breast, sides, and abdomen, greyish-black; lower tail-coverts white, lower wing-coverts bluish-grey. The general colour of the upper parts is dark bluish-grey; the outer web of the first quill greyish-black.

Length to end of tail 9 inches, to end of wings 11; extent of wings 24; wing from flexure 8¾; tail 3½; bill along the back 1$\frac{1}{12}$, along the edge of lower mandible 1$\frac{5}{12}$; tarsus $\frac{8}{12}$; middle toe $\frac{8}{12}$, its claw $\frac{4}{12}$. Weight 3 oz.

Young Male in autumn.

The bill, iris, and feet, nearly as in the adult. The upper parts are greyish-blue, the feathers of the fore part of the back, and especially the scapulars, brown towards the end; the upper and hind part of the head greyish

Least Tern.

1. Adult in Spring. 2. Young.

Drawn from Nature by J.J. Audubon, F.R.S.F.L.S.

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black, of which there is a darker mark behind, and another before the eye; the forehead greyish-white, as are the sides of the head, the fore neck, the breast, and the abdomen; the sides dusky-grey; the lower wing-coverts greyish-white. The quills are darker towards the end, and the first primary is black along the outer web.

Length to end of tail 7¾ inches, to end of wings 9$\frac{8}{12}$; wing from flexure 7¾; tail 2$\frac{10}{12}$; bill along the ridge $\frac{11}{12}$, along the edge of lower mandible 1$\frac{2}{12}$; tarsus $\frac{7}{12}$; middle toe $\frac{8}{12}$, its claw $\frac{3}{12}$.

Tongue 1 inch in length, very slender, grooved above in its whole length, tapering to a very fine horny point, which is a little slit. Œsophagus 3½ inches long, ½ inch wide, within the thorax dilated to a very large sac, 9 twelfths in breadth. Stomach of moderate size, roundish, 8 twelfths long, 7 twelfths broad; the lateral muscles moderate, the tendons large, the epithelium dense, with large longitudinal rugæ. The proventricular belt 8 twelfths in breadth. Intestine 12½ inches long, from 2 twelfths to 1 twelfth in width; cœca 1½ twelfths long, ½ twelfth wide, 1 inch 2 twelfths from the extremity; cloaca globular, 7 twelfths in width. Liver very large, the left lobe 10 twelfths long, the right 1 inch 2 twelfths. Trachea 2 inches 7 twelfths long, 2½ twelfths wide, tapering to 1 twelfth; the rings slender, unossified, 102 in number. Bronchi rather wide, of 20 half rings. Muscles as in the other Terns.

LEAST TERN.

STERNA MINUTA, *Linn.*

PLATE CCCCXXXIX.—ADULT AND YOUNG

As no account of this species exists in the Fauna Boreali-Americana, it is to be supposed that it is not met with beyond the western shores of Labrador, where however I found it in abundance, and breeding, in the beginning of June 1833. On the 14th of August following I observed them at Newfoundland, moving southward in detached parties of old and young, against a strong breeze, and uttering their clamorous cries. Again, in the end of April 1837, hundreds of pairs were breeding on the islands of Galveston Bay in Texas, the numerous specimens which I then examined exhibiting

no difference from those obtained in Labrador and in our Middle Districts. Nay, once, in the middle of June, while wading through the quick-sands of Bayou Sara in Louisiana, I came to a high and dry sand-bar where I picked up several eggs belonging to three pairs of birds of this species, although the distance was about two hundred miles from the sea in a direct line. I have at various times observed this tern on the waters of the Ohio in autumn, and now and then in spring, at the latter period in company with the Short-tailed Tern, *Sterna nigra*, and have again met with it on the shores of Lake Erie. I have also found it in winter on the eastern coast of the Floridas, but in small numbers. Few birds indeed seem to me to be so irregular in their migratory movements, for they appear to stop at any convenient breeding place from Texas to Labrador.

Few birds are more gentle than this delicate species is at times; for, apparently unaware of danger from the vicinity of man, it allows him to approach within a few yards, whether it be on wing or on the ground. Indeed, in the latter case, I have seen it when gorged so reluctant to fly off that I have more than once thought it was asleep, although on coming up I was always disappointed in my attempts to catch it. Nothing can exceed the lightness of the flight of this bird, which seems to me to be among water fowls, the analogue of the Humming-bird. They move with great swiftness at times, at others balance themselves like hawks over their prey, then dart with the velocity of thought to procure the tiny fry beneath the surface of the waters. When you invade their breeding place, they will sometimes sweep far away, and suddenly return, coming so near as almost to strike you. While travelling, their light but firm flight is wonderfully sustained; and on hearing and seeing them on such occasions, one is tempted to believe them to be the happiest of the happy. They seem as if marshalled and proceeding to a merry-making, so gaily do they dance along, as if to the music of their own lively cries. Now you see the whole group suddenly check their onward speed, hover over a deep eddy supplied with numberless shrimps, and dash headlong on their prey. Up rises the little thing with the shrimp in its bill, and again down it plunges; and its movements are so light and graceful that you look on with pleasure, and are in no haste to depart. Should this scene be enacted while they have young in their company, the latter await in the air the rise of their parents, meet them, and receive the food from them. When all are satiated, they proceed on their journey, stopping at another similar but distant place.

Although along our Southern and Middle Districts, the Least Tern merely scoops a very slight hollow in which to deposit its eggs, doing this from the first of April to the first of June, according to the latitude of the place, those which I found breeding on the coast of Labrador had formed very snug

nests, composed of short fragments of dry moss, well matted together, and nearly of the size of that of the American Robin, *Turdus migratorius;* while those met with on the islands near the Bay of Galveston, were observed to have laid their eggs upon the dry drifted weeds which appeared to have been gathered by them for the purpose. The nests are generally placed out of reach of the tides, but on some occasions I have known the hopes of a whole colony destroyed by the sudden overflow of their selected places, caused by a severe gale, and have observed that on such occasions, their clamour was as great as if they had been robbed of their eggs by man.

The number of eggs deposited by this species is more frequently three than four. Like those of most other Terns, they differ somewhat in size and markings, although I never found any so large as those described by WILSON, who states that they measure nearly an inch and three quarters in length, which would better agree with the eggs of the Common Tern. The average of a basketful was found to be one inch and two and a half eighths in length, by seven and a half eighths in breadth. They are rather pointed at the smaller end, and their ground colour is pale yellowish-white, blotched with irregular dark brown spots, intermixed with others of a dull purplish tint.

I have found this Tern breeding among Shearwaters along the Florida coast; and my friend the Reverend JOHN BACHMAN has observed the same circumstance on the "Bird's Banks," on the coasts of South Carolina, where it is abundant, as well as on Sullivan Island.

The common note of our Least Tern resembles that of the Barn Swallow when disturbed about its nest, being as smartly and rapidly repeated at times. When it proves convenient for it to alight on the ground or on a sand-beach, after it has secured a prawn or small fish, it does so, and there devours its prey piecemeal, but it more usually swallows it on wing. On the ground it walks prettily, with short steps, keeping its tail somewhat raised.

LEAST TERN, *Sterna minuta*, Wils. Amer. Orn., vol. vii. p. 80.
STERNA MINUTA, Bonap. Syn., p. 355.
SILVERY TERN, *Sterna argentea*, Nutt. Man. vol. ii. p. 280.
LEAST TERN, *Sterna minuta*, Aud. Orn. Biog., vol. iv. p. 175.

Adult, 8¾, 18¾.

Breeds from Galveston along the shores to Labrador. Not mentioned as found in the Fur Countries. Returns southward, and passes beyond Texas in autumn. Extremely abundant at times on the Great Lakes, as well as the Ohio and Mississippi.

Adult Male.

Bill about the length of the head, slender, tapering, much compressed, nearly straight, extremely attenuated towards the end. Upper mandible with the dorsal line slightly arched, the ridge rather broad and convex at the base, narrow towards the end, the sides nearly erect, the edges sharp and direct. Nasal groove short, extending to a fourth of the length of the bill; nostrils basal, linear, direct, pervious. Lower mandible with the angle extremely narrow, very acute, extending to the middle, the dorsal line straightish, the sides erect, the edges sharp and inflected, the tip extremely acute.

Head of moderate size, ovate; neck short; body very slender; feet small. Tibia bare below; tarsus very short, slender, compressed, covered anteriorly with small scutella, laterally and behind with reticular scales; toes small, slender, the first extremely small, the third longest, the fourth considerably shorter, all scutellate above, the anterior united by reticulated webs having a deeply concave margin. Claws arched, compressed, acute, that of hind toe smallest, of middle toe by much the largest, and having its inner edge thin and dilated.

Plumage soft, close, blended, very short on the fore part of the head; the feathers in general broad and rounded. Wings very long, narrow, and pointed; primary quills tapering, straight, the first longest, the next five-twelfths of an inch shorter, the rest rapidly graduated; secondary quills short, broad, incurved, narrowed towards the end, the inner straight. Tail rather long, very deeply forked, the lateral feathers extending an inch and seven-twelfths beyond the fork.

Bill light yellowish-orange, its tips black, but the extreme points horn-colour. Iris hazel; feet light orange-red, the bare part of the tibia dusky; claws black. On the forehead, a triangular white patch extending to the middle of the eye; upper part of the head and the nape, with a line from the eye to the bill, deep black; sides of the head, fore-neck and lower parts, pure white; back and wings very pale bluish-grey; first two quills with the outer web greyish-black, and rather less than half of their inner web of the same colour, the rest white, extending to about half an inch from their extremities. Tail white in summer, of a paler tint than the back at other times.

Length to end of tail 8¾ inches, to end of wings 9½, to end of claws 7½, to end of shortest tail-feathers 7; extent of wings 18¾; wings from flexure 6$\frac{11}{12}$; tail 3½; bill along the ridge 7½ twelfths, along the edge of lower mandible 1$\frac{5}{12}$; tarsus $\frac{7}{12}$; middle toe $\frac{7}{12}$, its claw $\frac{3}{12}$.

The Female is a little smaller than the male, but otherwise similar.

Young fledged.

Bill greenish-black. Iris dusky. Feet pale yellowish-orange. All the

Nº 88.
Pl. 440.
Noddy Tern
Male.
Drawn from Nature by J.J.Audubon, F.R.S.F.L.S.
Lith^d Printed & Col^d by J. T. Bu

under parts dull greyish-white, as are the upper parts, including the tail; the hind part of the head streaked with dusky; on the back and rump the feathers with a curved marginal band of greyish-brown; primary quills greyish-brown, the outer two darker. At this period the tail is even, each feather narrowly margined with greyish-white.

In a male bird the tongue is 10 twelfths long, slender, triangular, tapering to a point, horny beneath, emarginate and papillate at the base. On the palate are five longitudinal ridges. The posterior aperture of the nares is linear, 7 twelfths long. The œsophagus is 4 inches 2 twelfths long, very wide, its average diameter on the neck 4½ twelfths, within the thorax 9 twelfths; it is exceedingly thin and delicate, its muscular fibres scarcely apparent, unless closely examined. The proventriculus is only a quarter of an inch long. The stomach is 9 twelfths long, 8 twelfths broad, its lateral muscles of considerable size, the cuticular lining dense, tough, longitudinally rugous, and of a reddish-brown colour, as in Gulls. Contents of stomach and œsophagus, small fishes, one of them 2 inches long. The intestine is 14 inches long, its diameter 1½ twelfths. The cœca are 2 twelfths long nearly one twelfth in diameter.

The trachea is 2 inches and 4 twelfths long, its diameter 2 twelfths at the top, diminishing to 1 twelfth; its rings about 105, unossified; its lateral muscles moderate, as are the sterno-tracheal, and single pair of inferior laryngeal. The bronchial half-rings about 25.

THE NODDY TERN.

STERNA STOLIDA, *Linn.*

PLATE CCCCXL.—MALE.

About the beginning of May, the Noddies collect from all parts of the Gulf of Mexico, and the coasts of Florida, for the purpose of returning to their breeding places, on one of the Tortugas called Noddy Key. They nearly equal in number the Sooty Terns, which also breed on an island a few miles distant. The Noddies form regular nests of twigs and dry grass, which they place on the bushes or low trees, but never on the ground. On visiting their island on the 11th of May, 1832, I was surprised to see that

many of them were repairing and augmenting nests that had remained through the winter, while others were employed in constructing new ones, and some were already sitting on their eggs. In a great many instances, the repaired nests formed masses nearly two feet in height, and yet all of them had only a slight hollow for the eggs, broken shells of which were found among the entire ones, as if they had been purposely placed there. The birds did not discontinue their labours, although there were nine or ten of us walking among the bushes, and when we had gone a few yards into the thicket, thousands of them flew quite low over us, some at times coming so close as to enable us to catch a few of them with the hand. On one side might be seen a Noddy carrying a stick in its bill, or a bird picking up something from the ground to add to its nest; on the other several were seen sitting on their eggs unconscious of danger, while their mates brought them food. The greater part rose on wing as we advanced, but re-alighted as soon as we had passed. The bushes were rarely taller than ourselves, so that we could easily see the eggs in the nests. This was quite a new sight to me, and not less pleasing than unexpected.

The Noddy, like most other species of Terns, lays three eggs, which average two inches in length, by an inch and three-eighths in breadth, and are of a reddish-yellow colour, spotted and patched with dull red and faint purple. They afford excellent eating, and our sailors seldom failed to collect bucketsful of them daily during our stay at the Tortugas. The wreckers assured me that the young birds remain along with the old through the winter, in which respect the Noddy, if this account be correct, differs from other species, the young of which keep by themselves until spring.

At the approach of a boat, the Noddies never flew off their island, in the manner of the Sooty Terns. They appeared to go farther out to sea than those birds, in search of their food, which consists of fishes mostly caught amid the floating sea-weeds, these Terns seizing them, not by plunging perpendicularly downwards, as other species do, but by skimming close over the surface in the manner of Gulls, and also by alighting and swimming round the edges of the weeds. This I had abundant opportunities of seeing while on the Gulf of Mexico.

The flight of this bird greatly resembles that of the Night Hawk when passing over meadows or rivers. When about to alight on the water, the Noddy keeps its wings extended upwards, and touches it first with its feet. It swims with considerable buoyancy and grace, and at times immerses its head to seize on a fish. It does not see well by night, and it is perhaps for this reason that it frequently alights on the spars of vessels, where it sleeps so sound that the seamen often catch them. When seized in the hand, it utters a rough cry, not unlike that of a young American Crow taken from

the nest. On such occasions, it does not disgorge its food, like the Cayenne Tern and other species, although it bites severely, with quickly repeated movements of the bill, which, on missing the object aimed at, snaps like that of our larger Fly-catchers. Some which I kept several days, refused all kinds of food, became dull and languid, and at length died.

STERNA STOLIDA, Bonap. Syn., p. 356.
NODDY, Nutt. Man., vol. ii. p. 285.
NODDY TERN, *Sterna stolida*, Aud. Orn. Biog., vol. iii. p. 516; vol. v. p. 642.

Male, $16\frac{1}{12}$, 32.

Abundant on the Gulf of Mexico during the whole year. Breeds in vast multitudes on the Tortugas Keys.

Adult Male.

Bill longer than the head, strong, slender, nearly straight, compressed, very acute. Upper mandible with the dorsal line slightly arched, the ridge broad and convex at the base, narrowed towards the end, the sides convex, the edges sharp and inflected, the tip acute. Nasal groove extended to beyond half the length of the bill, slightly deflected towards the edge; nostrils submedial, linear, direct, pervious. Lower mandible with the angle very narrow, acute, extending to the middle, the dorsal line straight or very slightly concave, the sides convex, the sharp edges inflected, the tip extremely acute.

Head of moderate size, oblong, compressed; neck of moderate length; body slender; feet very short, rather stout. Tibia bare for a short space; tarsus very short, roundish, covered anteriorly with small scutella, laterally and behind with reticulated scales; toes slender, the first very small, the third longest, the fourth nearly as long, the second much shorter, all scutellate above, the anterior united by reticulated webs, having an incurved margin; claws curved, compressed, acute, that of hind toe smallest, of middle toe by much the largest, and having the inner edge thin and dilated.

Plumage soft, close, blended, very short on the head; the feathers in general broad and rounded. Wings very long, narrow, and pointed; primary quills tapering but rounded, the first longest, the rest rapidly graduated; secondaries short, broad, rather acute, the inner more tapering. Tail long, cuneate, of twelve tapering rounded feathers.

Bill black. Iris brown. Feet dull brownish-red, the webs dusky, the claws black. The general colour is sooty brown; the primaries and tail-feathers brownish-black; the upper part of the head greyish-white; a black spot anterior to and over the eye.

Length to end of tail $16\frac{4}{12}$, to end of wings $16\frac{1}{12}$, to end of claws $13\frac{1}{12}$;

extent of wings 32; wing from flexure $10\frac{10}{12}$; tail $5\frac{3}{4}$; bill along the back $1\frac{3}{4}$, along the edge of lower mandible $2\frac{1}{4}$; tarsus $\frac{10}{12}$; middle toe $1\frac{1}{4}$, its claw $\frac{4}{12}$. Weight $4\frac{3}{4}$oz.

Width of mouth 9 twelths. Tongue 1 inch 3 twelfths long, very slender, tapering to a horny point, grooved above, emarginate and papillate at the base. Œsophagus 4 inches 4 twelfths long, its width along the neck 8 twelfths, within the thorax dilated as in the last species, its breadth 1 inch 1 twelfth: the proventricular belt 4 twelfths broad. Stomach very small, 10 twelfths long, 8 twelfths in breadth, of the same structure as in the last. Lobes of liver 1 inch 2 twelfths and 11 twelfths; gall-bladder oblong, 6 twelfths in length, 3 twelfths in breadth. Intestine 13 inches long, $2\frac{1}{2}$ twelfths wide at the commencement, $1\frac{1}{2}$ twelfths toward the rectum; cœca $2\frac{1}{4}$ twelfths long, $\frac{1}{2}$ twelfth wide, $1\frac{1}{2}$ inches from the extremity; cloaca ovate, 7 twelfths in width. Trachea 3 inches long, from $2\frac{3}{4}$ twelfths to $1\frac{1}{2}$ twelfths in breadth, roundish; the rings 110, very feeble. Bronchi very wide, one with 26, the other with 24 half rings.

Genus III.—LARUS, *Linn.* GULL.

Bill shorter than the head, nearly straight, moderately stout, compressed; upper mandible with its dorsal outline straight to the middle, then decurved, the ridge convex, the sides rapidly sloping, the edges sharp and direct, the tip rather obtuse; nasal groove rather long and narrow; nostrils sub-medial, longitudinal, linear-oblong, broader anteriorly; lower mandible with the angle long and pointed, the outline of its crura decurved anteriorly, that of the ridge slightly concave and ascending, the sides erect, the edge-line decurved toward the tip, which is narrow but obtuse. Head of moderate size, broadly ovate; neck of ordinary length; body compact. Feet rather long or of moderate length, rather stout; tibia bare at the lower part; tarsus moderately compressed, with numerous curved anterior scutella, and smaller behind; toes slender, of moderate length, scutellate; first very small, third a little longer than fourth. Claws small, slightly arched, compressed, rather

Fork-tailed Gull

Drawn from Nature by J.J. Audubon FRSEL.S.

Lith.d Printed & Col.d by J.T. Bowen Philad.a

blunt. Plumage close, soft, blended, on the back and wings rather compact. Wings very long, pointed; first and second quills longest; secondaries broad, the inner more elongated. Tail of moderate length, generally even, rarely rounded or emarginate, of twelve feathers. In those which have the head white in summer, it is streaked with dusky in winter; and those which are hooded in summer, have the head white and slightly streaked in winter.

THE FORKED-TAILED GULL.

LARUS SABINI, *Sabine.*

PLATE CCCCXLI.—MALE.

On my return from Labrador, I had the pleasure of seeing this interesting little Gull flying over the harbour of Halifax in Nova Scotia. It was in company with our Common American Gull. Although I have not observed it on our eastern shores or farther south on the coast, it is not improbable that it rambles there in winter along with other species which, like itself, breed far north. Its flight in some measure resembles that of the Common Tern, although it is more decided, and, consequently, more like that of the smaller species of its own genus. In the course of a voyage from Pictou in Nova Scotia to Hull in England, lately performed by my friend Mr. THOMAS MACCULLOCH, he saw great numbers of this species when more than a hundred miles off Newfoundland. They flew around the ship in company with an almost equal number of Ross' Gull.

Dr. RICHARDSON gives the following account of the Forked-tailed Gull, in the Fauna Boreali-Americana. "This interesting species of Gull was discovered by Captain EDWARD SABINE. It was first seen on the 25th of July at its breeding station on some low rocky islands lying off the west coast of Greenland, associated in considerable numbers with the Arctic Tern, the nests of both birds being intermingled. It is analogous to the Tern not only in its forked tail, and in its choice of a breeding place, but also in the boldness which it displays in the protection of its young. The parent birds flew with impetuosity towards persons approaching their nests, and when one was killed, its mate, though frequently fired at, continued on the wing close to the spot. They were observed to get their food on the sea-beach,

standing near the water's edge, and picking up the marine insects which were cast on shore. A solitary individual was seen in Prince-Regent's Inlet, on Sir EDWARD PARRY'S first voyage, and many specimens were procured in the course of the second voyage on Melville Peninsula. Captain SABINE also killed a pair at Spitzbergen, so that it is a pretty general summer visitor to the Arctic Seas, and is entitled to be enumerated amongst the European as well as the American birds. It arrives in the high northern latitudes in June, and retires to the southward in August. Specimens procured in June and July corresponded exactly with the one described below. When newly killed, they all had a delicate pink blush on their under plumage. The eggs, two in number, are deposited on the bare ground, and are hatched in the last week of July. They are an inch and a half in length, and have an olive colour with many brown blotches."

At the approach of autumn, it frequently happens that several species of Gulls associate together, and at times congregate in great numbers on the outer margins of sand-bars and in the large estuaries. There they keep up a constant cackling, run about, dress their plumage, and await the rising of the waters. If disturbed at such times, they show greater shyness than perhaps at any other. One of the oldest birds sounds an alarm, and all simultaneously take to wing, disperse, and gradually rise to a great elevation, flying in wide circles, and moving seaward. I have thought it remarkable that these birds seldom shun the fishermen, while towards any one bearing the semblance of a gunner they act with extreme caution. Although loquacious when congregated, they are, when separated, quite silent, especially when on wing. In squally and rainy weather they skim low over the water or the land, always against the wind. They are very tenacious of life, and often, when wounded, revive after you had considered them incapable of breathing. The instant they are caught they are wont to mute and eject the contents of their stomach, as well as when suddenly compelled to take to wing, or when pursued by predaceous birds. In particular states of the weather they appear at a distance much larger than they really are, and, on such occasions, they also seem much nearer, so that the gunner is greatly deceived, and may shoot at them when too far off.

LARUS SABINI, *Fork-tailed Gull*, Swains. and Rich. F. Bor. Amer., vol. ii. p. 428.
FORK-TAILED GULL, Nutt. Man., vol. ii. p. 295.
FORKED-TAILED GULL, *Larus Sabini*, Aud. Orn. Biog., vol. iii. p. 561.

Male, 13, 33.

Accidental as far south in winter as New York. Rather common along the coast of Nova Scotia. Breeds in Newfoundland, and along the coasts of the Arctic Seas. Seen on the banks of Newfoundland in great numbers.

Adult Male.

Bill rather shorter than the head, nearly straight, rather slender, compressed. Upper mandible with its dorsal line straight to the middle, then curved and declinate, the ridge convex, the sides slightly convex, the edges sharp and inflected, the tip rather obtuse. Nasal groove rather long and narrow; nostrils in its fore part, longitudinal, sub-medial, linear, pervious. Lower mandible with a slight prominence at the end of the angle, which is long and narrow, the dorsal line then straight or slightly concave, the ridge convex, the sides nearly flat.

Head of moderate size. Neck short. Body rather slender. Wings very long. Feet of moderate length, rather strong; tibia bare below for a short space, covered behind with narrow scutella; tarsus compressed, anteriorly covered with numerous scutella and three inferior series of transverse scales, laterally with rounded scales, posteriorly with oblique scutella. Toes slender, scutellate above; first extremely small, second much shorter than fourth, third longest, anterior toes connected by reticulated webs, the outer and inner slightly marginate; claws small, compressed, obtuse, that of middle toe with an expanded inner edge.

Plumage close, soft, blended. Wings very long and pointed; primaries tapering and rounded, first longest, second almost equal, the rest rapidly graduated; secondaries obliquely pointed, the rounded extremity extending beyond the tip of the shaft, which is exterior to it, the inner feathers more elongated. Tail of moderate length, forked, of twelve feathers.

Bill black at the base for more than half its length, the rest pure yellow. Edges of eyelids vermilion, as is the inside of the mouth. Feet black. Head and upper part of neck all round blackish-grey, that colour terminated below by a ring of pure black encircling the neck. Lower neck all round, the whole lower surface, the upper tail-coverts and the tail, pure white. The back and wings are bluish-grey, excepting a large terminal portion of the secondaries, and the tips of the primaries, which are white, the primaries themselves being black, with their shafts brownish-black. The first quill of the specimen figured had no white on the tip, but some individuals differ in this respect.

Length to end of tail 13 inches, to end of wings $14\frac{3}{4}$; extent of wings 33; wing from flexure $10\frac{3}{4}$; tail 5; bill along the ridge 1, along the edges $1\frac{1}{4}$; tarsus $1\frac{5}{12}$; middle toe 1, its claw $\frac{2}{12}$. Weight 7 oz.

The Female is rather less than the male, but in other respects similar.

ROSS' GULL.

LARUS ROSSII, *Richardson.*

(NOT FIGURED.)

Not having met with this beautiful little Gull, I am obliged to refer to Dr. RICHARDSON'S description of it in the Fauna Boreali-Americana.

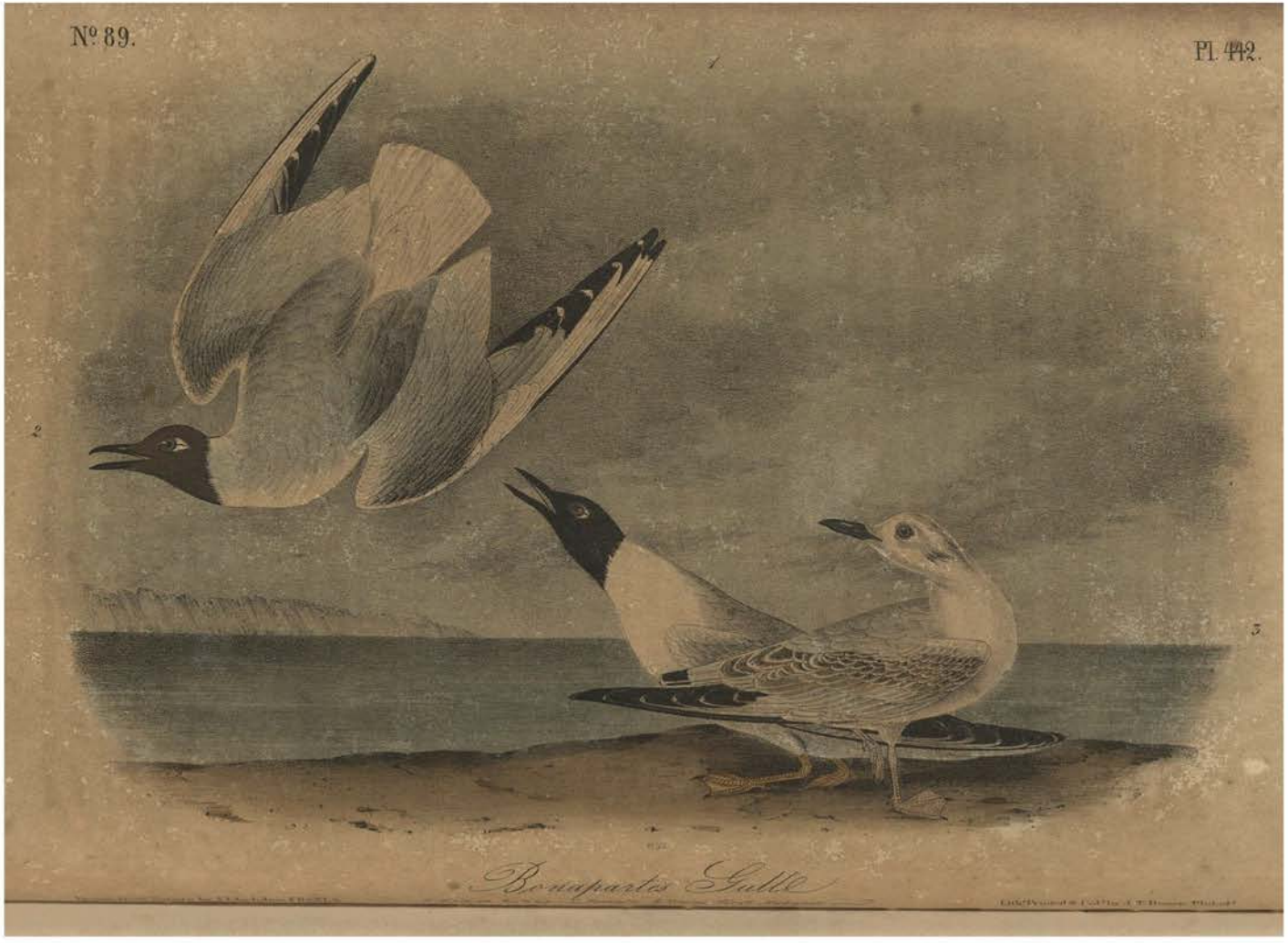
"Cuneate-tailed Gull, with a pearl-grey mantle. Wings longer than the cuneiform tail. The outer web of the first tail-feather blackish; a slender black bill, tarsi an inch long, and, as well as the feet, vermilion red.

"Two specimens of this Gull were killed on the coast of Melville Peninsula, on Sir EDWARD PARRY'S second voyage, one of which is preserved in the Museum of the University of Edinburgh, and the other was presented to JOSEPH SABINE, Esq. No other examples are known to exist in collections; but Commander ROSS, in his Zoological Appendix to Sir EDWARD PARRY'S narrative of his most adventurous boat-voyage towards the Pole, relates that several were seen during the journey over the ice north of Spitzbergen, and that Lieutenant FORSTER also found the species in Waygait Straits, which is probably one of its breeding places. It is to Commander Ross, who killed the first specimen which was obtained, that the species is dedicated, as a tribute for his unwearied exertions in the promotion of natural history on the late Arctic voyages, in all of which he bore a part. Of the peculiar habits or winter retreat of this species nothing is known.

"Description of a specimen killed, June 1823, at Alagnak, Melville Peninsula, lat. 69¼° N.

"Colour.—Scapulars, inter-scapulars, and both surfaces of the wings clear pearl-grey; outer web of the first quill blackish-brown to the tip, which is grey; tips of the scapulars and lesser quills whitish. Some small feathers near the eye, and a collar round the middle of the neck pitch black; rest of the plumage white. The neck above and the whole under plumage deeply tinged with peach-blossom, red in recent specimens. Bill black; its rictus and the edges of the eyelids reddish-orange. Legs and feet vermilion-red; nails blackish.

"Form.—Bill slender, weak, with a scarcely perceptible salient angle beneath; the upper mandible slightly arched and compressed towards the point; the commissure slightly curved at the tip. Wings an inch longer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Bonapartes Gulle

than the decidedly cuneiform tail, of which the central feathers are an inch longer than the lateral. Tarsi rather stout; the thumb very distinct, armed with a nail as large as that of the outer toe.

"The other specimen killed by Mr. SHERER a few days later, differs only in the first primary coverts having the same dark colour with the outer web of the first primary itself.

"Length to end of tail 14 inches; tail $5\frac{1}{2}$; wing $10\frac{1}{2}$; bill along the ridge $\frac{3}{4}$; rictus $1\frac{1}{4}$; from nostril to tip of bill $\frac{11}{12}$; tarsus $1\frac{1}{12}$; middle toe $\frac{10}{12}$; its nail $\frac{3}{12}$.

LARUS ROSSII, *Cuneate-tailed Gull*, Swains. and Rich. F. Bor. Amer., vol. ii. p. 427.
ROSS' GULL, *Larus Rossii*, Aud. Orn. Biog., vol. v. p. 324.

Adult, 14; wing $10\frac{1}{2}$.
Arctic Seas.

BONAPARTE'S GULL.

LARUS BONAPARTII, *Richardson.*

PLATE CCCCXLII.—MALE, FEMALE, AND YOUNG.

My first acquaintance with this species took place whilst I was at Cincinnati, in the beginning of August, 1819. I was crossing the Ohio, along with Mr. ROBERT BEST, then curator of the Cincinnati Museum, for the purpose of visiting the Cliff Swallows which had taken up their abode on the walls of the garrison on the Kentucky side, when we observed two Gulls sweeping gracefully over the tranquil waters. Now they would alight side by side, as if intent on holding a close conversation; then they would rise on wing and range about, looking downwards with sidelong glances, searching for small fishes, or perhaps eyeing the bits of garbage that floated on the surface. We watched them for nearly half an hour, and having learned something of their manners, shot one, which happened to be a female. On her dropping, her mate almost immediately alighted beside her, and was shot. There, side by side, as in life, so in death, floated the lovely birds. One, having a dark bluish nearly black head, was found to be the male; the

other, with a brown head, was a female. On the 12th of November, 1820, I shot one a few miles below the mouth of the Arkansas, on the Mississippi, which corresponded in all respects with the male just mentioned.

No sooner do the shad and old-wives enter the bays and rivers of our Middle Districts, than this Gull begins to shew itself on the coast, following these fishes as if dependent upon them for support, which however is not the case, for at the time when these inhabitants of the deep deposit their spawn in our waters, the Gull has advanced beyond the eastern limits of the United States. However, after the first of April, thousands of Bonapartian Gulls are seen gambolling over the waters of Chesapeake Bay, and proceeding eastward, keeping pace with the shoals of fishes.

During my stay at Eastport, in Maine, in May, 1833, these Gulls were to be seen in vast numbers in the harbour of Passamaquody at high water, and in equal quantities at low water on all the sand and mud-bars in the neighbourhood. They were extremely gentle, scarcely heeded us, and flew around our boats so close that any number might have been procured. My son JOHN shot seventeen of them at a single discharge of his double-barrelled gun, but all of them proved to be young birds of the preceding year. On examining these specimens, we found no development of the ovaries in several, which, from their smaller size, we supposed to be females, nor any enlargement of the testes in the males; and as these young birds kept apart from those which had brown and black hoods, I concluded that they would not breed until the following spring. Their stomachs were filled with *coleopterous insects*, which they caught on the wing, or picked up from the water, into which they fell in great numbers when overtaken by a cold fog, while attempting to cross the bay. On the 24th of August, 1831, when at Eastport with my family, I shot ten of these Gulls. The adult birds had already lost their dark hood, and the young were in fine plumage. In the stomach of all were shrimps, very small fishes, and fat substances. The old birds were still in pairs.

When exploring the Bay of Fundy, in May, 1833, I was assured by the captain and sailors, as well as the intelligent pilot of the revenue tender Nancy, that this Gull bred in great abundance on the islands off Grand Manan; but unfortunately I was unable to certify the fact, as I set out for Labrador previous to the time at which they breed in that part of the country. None of them were observed on any part of the Gulf of St. Lawrence, or on the coast of Labrador or Newfoundland. In winter this species is common in the harbour of Charleston, but none are seen at that season near the mouths of the Mississippi.

The flight of this Gull is light, elevated, and rapid, resembling in buoyancy that of some of our Terns more than that of most of our Gulls, which move

their wings more sedately. I found the adult birds in moult in August. Although their notes are different from those of all our other species, being shriller and more frequent, I am unable to represent them intelligibly by words.

Since I began to study the habits of Gulls, and observe their changes of plumage, whether at the approach of the love season, or in autumn, I have thought that the dark tint of their hoods was in the first instance caused by the extremities of the feathers then gradually changing from white to black or brown, without the actual renewal of the feathers themselves, as happens in some species of land-birds. At Eastport, I had frequent opportunities of seeing the black-hooded males copulating with the brown-hooded females, so that the colour of the head in the summer season is really distinctive of the sexes. I found in London a pair of these birds, of which the sexes were distinguished by the colour of the head, and which had been brought from Greenland. They were forwarded by me to the Earl of DERBY, in whose aviaries they are probably still to be seen.

This is certainly the species described in the Fauna Boreali-Americana under the same name; but it is there stated that the females agree precisely with the males, their hood being therefore "greyish-black;" which I have never found to be the case. As to the *Larus capistratus* of Bonaparte's Synopsis, I have nowhere met with a Brown-headed Gull having the tail "sub-emarginate;" and I infer that the bird described by him under that name is merely the female of the present species.

BROWN-MASKED GULL, *Larus capistratus*, Bonap. Amer. Orn., vol. iv. Female.
LARUS CAPISTRATUS, Bonap. Syn., p. 358.
LARUS BONAPARTII, *Bonapartian Gull*, Swains. and Rich. F. Bor. Amer., vol. ii. p. 425.
BONAPARTIAN GULL, Nutt. Man., vol. ii. p. 294.
BONAPARTIAN GULL, *Larus Bonapartii*, Aud. Orn. Biog., vol. iv. p. 212.

Adult, 14⅛, 32¼.

Extremely abundant in winter, on the coast of Florida. Equally plentiful in spring, along the coasts of the Middle and Eastern Districts, especially in the Chesapeake. Breeds from the Bay of Fundy to high latitudes. Not uncommon in autumn, on the Great Lakes, and the Ohio and Mississippi.

Adult Male in spring plumage.

Bill shorter than the head, nearly straight, slender, compressed. Upper mandible with its dorsal line straight to the middle, then curved and declinate, the ridge narrow, the sides slightly convex, the edges sharp and a little inflected, the tips narrow but rather obtuse, with a slight notch on each side. Nasal groove rather long and narrow; nostrils in its fore part, longitudinal, sub-medial, linear, pervious. Lower mandible with a slight

prominence at the end of the angle, which is long and narrow, the dorsal line then ascending and slightly concave, the ridge convex, the sides nearly erect and flattened.

Head of moderate size, ovate, narrowed anteriorly, convex above. Eyes of moderate size. Neck rather short. Body rather slender. Wings very long. Feet of moderate length, rather strong; tibia bare below for a short space, covered behind with narrow scutella; tarsus compressed, anteriorly covered with numerous scutella and three inferior series of transverse scales, laterally with oblong scales, posteriorly with oblique scutella. Toes slender, with numerous scutella; first extremely small, second considerably shorter than fourth, third longest; anterior toes connected by reticulated webs, of which the anterior margins are deeply concave, the outer and inner slightly marginate. Claws small, compressed, moderately arched, rather obtuse, that of middle toe with an expanded inner edge.

Plumage full, close, soft, blended. Wings very long and pointed; primaries tapering and rounded, first longest, second very little shorter, the rest rapidly graduated; secondaries obliquely pointed, the rounded extremity extending beyond the tip of the shaft, which is exterior to it, the inner feathers more elongated. Tail of moderate length, almost even, the middle feathers slightly longer.

Bill black, inside of mouth vermilion. Iris reddish-hazel. Feet orange, slightly tinged with vermilion; claws dusky brown. Head and upper part of neck all round, greyish-black, that colour extending half an inch lower on the throat than on the occiput. A white band divided by a narrow black line margining the eye behind; the remaining part of the neck white; back, scapulars and wings, light greyish-blue. The anterior ridge of the wing, alula, smaller coverts on the carpal margin, four outer primary coverts, shaft and inner web of the outer primary, both webs of second, inner webs of third and fourth, white; of which colour also are the rump, tail, and all the lower parts. Outer web of first quill, excepting a small portion towards the end, its tip to the length of half an inch, black, as are the ends of the next six, which however have a small tip of white, the black on some of them about an inch long, and running along the inner ridge to a considerable extent.

Length to end of tail 14½ inches, to end of wings 15⅝, to end of claws 13⅛; extent of wings 32¼; wing from flexure 10¾; tail $4\frac{2}{12}$; bill along the ridge $1\frac{4}{12}$, along the edge of lower mandible $1\frac{9}{12}$; tarsus $1\frac{3}{12}$; hind toe and claw $\frac{3}{12}$; middle toe $1\frac{3}{12}$, its claw $\frac{3}{12}$; outer toe $1\frac{1}{12}$, its claw $\frac{2}{12}$; inner toe $\frac{11}{12}$, its claw $\frac{2}{12}$. Weight 6½ oz.

Adult Female.

The female is somewhat smaller, and resembles the male, but has the head and upper part of the neck umber-brown.

Young in December.

Bill greyish-black, iris dark brown; feet flesh-coloured, claws dusky. Head and neck greyish-white; a small black patch about an inch behind the eye on each side. Upper parts dull bluish-grey, many of the wing-coverts greyish-brown, edged with paler; quills as in the adult; rump and tail white, the latter with a broad band of black at the end, the tips narrowly edged with whitish.

Length to end of tail 13⅜, to end of wings 15⅝, to end of claws 13; extent of wings 32½ inches. Weight 6 oz.

The white spots on the tips of the wings vary greatly in size, and are frequently obliterated when the feathers become worn.

Palate with five series of small distant papillæ. Tongue 1 inch 1½ twelfths long, slender, tapering to a slit point, emarginate and papillate at the base, horny towards the end. Aperture of posterior nares linear, 9 twelfths long. Heart 1 inch long, 9 twelfths broad. Right lobe of liver 1 inch 11 twelfths long, the other lobe 1 inch 7 twelfths.

The œsophagus is 6½ inches long, very wide, with rather thin parietes, its average diameter when dilated 10 twelfths, within the thorax enlarged to 1 inch 2 twelfths. The transverse muscular fibres are distinct, the internal longitudinal less so; the mucous coat longitudinally plicate. The proventriculus is ½ inch long, with very numerous small glandules. The stomach is a small oblong gizzard, 10 twelfths long, 8 twelfths broad; its lateral muscles rather large, as are its tendons. The inner coat or epithelium is of moderate thickness, dense, with nine longitudinal broad rugæ, and of a brownish-red colour. The intestine is 24⅛ inches long, its diameter 2 twelfths. The rectum is 1½ inches long. The cœca are 2 twelfths long, 1 twelfth in diameter, cylindrical and obtuse.

The intestine of another individual, a male, is 20½ inches long, 3 twelfths in diameter.

The trachea is 3 inches 10 twelfths long, its diameter at the top 3 twelfths, at the lower part 2¼ twelfths, the rings very feeble, unossified, about 130 in number. The sterno-tracheal muscles are very slender, as are the contractors; and there is a pair of inferior laryngeals. The bronchi are of moderate length, with about 18 half rings.

BLACK-HEADED, OR LAUGHING GULL.

LARUS ATRICILLA, *Linn.*

PLATE CCCCXLIII.—MALE IN SPRING, AND YOUNG.

Much confusion appears to exist among authors regarding our Laughing Gull, and this, in my humble opinion, simply because not one of them has studied it, in its native haunts, and at all seasons, since the period when it was briefly characterized by our great master LINNÆUS, who, after all that has been said against him, has not yet had his equal. ALEXANDER WILSON, who, it seems, knew something of the habits of this bird, thought it however identical with the *Larus ridibundus* of Europe, as is shewn by the synonymes which he has given. Others, who only examined some dried skins, without knowing so much as the day or even the year in which they had been shot, or their sex, or whether the feathers before them had once belonged to a bird that was breeding, or barren, when it was procured, described its remains perhaps well enough for their own purpose, but certainly not with all the accuracy which is necessary to establish once and for ever a distinct species of bird. Others, not at all aware that most Gulls, and the present species in particular, assume, in the season of pairing, and in a portion of the breeding time, beautiful rosy tints in certain parts of their plumage, which at other periods are pure white, have thought that differences of this sort, joined to those of the differently-sized white spots observable in particular specimens, and not corresponding with the like markings in other birds of the same size and form, more or less observable at different periods on the tips of the quills, were quite sufficient to prove that the young bird, and the breeding bird, and the barren bird, of one and the same species, differed specifically from the old bird, or the winter-plumage bird. But, reader, let us come to the point at once.

At the approach of the breeding season, or, as I like best to term it, the love season, this species becomes first hooded, and the white feathers of its breast, and those of the lower surface of its wings, assume a rich blush of roseate tint. If the birds procured at that time are several years old and perfect in their powers of reproduction, which is easily ascertained on the spot, their primary quills shew little or no white at their extremities, and their hood descends about three quarters of an inch lower on the throat than

J. J. A.

Black-headed Gull

1 Adult Male Spring Plumage 2 Young first Autumn

Drawn from Nature by J.J Audubon, F.R.S.F.L.S.

Lith.d Printed & Col.d by J. T. Bowen, Phila.a

on the hind part of the head, provided the bird be a male. But should they be barren birds, *the hood will be wanting*, that portion of their plumage remaining as during winter, and although the primaries will be black, or nearly so, each of them will be broadly tipped, or marked at the end, with a white spot, which in some instances will be found to be fully half an inch in size; yet the tail of these birds, as if to prove that they are adults, is as purely white to its extreme tip, as in those that are breeding; but neither the breast, nor the under wing-coverts, will exhibit the rosy tint of one in the full perfection of its powers.

The males of all the Gulls with which I am acquainted, are larger than the females; and this difference of size is observable in the young birds even before they are fully fledged. In all of these, however, putting aside their sex, I have found great differences of size to exist, sometimes as much as two inches in length, with proportional differences in the bills, tarsi, and toes; and this, in specimens procured from one flock of these Gulls at a single discharge of the gun, and at different seasons of the year. The colour of their bills too is far from being always alike, being brownish-red in some, purplish or of a rich and deep carmine in others. As to the white spots on the extremities of the primary quills of birds of this family, I would have you, reader, never to consider them as affording essential characters. Nay, if you neglect them altogether, you will save yourself much trouble, as they will only mislead you by their interminable changes, and you may see that the spots on one wing are sometimes different in size and number from those on the other wing of the same specimen. If all this be correct, as I assure you it must be, being the result of numberless observations made in the course of many years, in the very places of resort of our different Gulls, will you not agree with me, reader, that the difficulty of distinguishing two very nearly allied species must be almost insuperable when one has nothing better than a few dried skins for objects of observation and comparison?

The Black-headed Gull may be said to be a constant resident along the southern coast of the United States, from South Carolina to the Sabine river; and I have found it abundant over all that extent both in winter and in summer, but more especially on the shores and keys of the Floridas, where I found it breeding, as well as on some islands in the Bay of Galveston in Texas. A very great number of these birds however remove, at the approach of spring, towards the Middle and Eastern Districts, along the shores of which they breed in considerable numbers, particularly on those of New Jersey and Long Island, as well as on several islands in the Sound. They constantly evince a dislike to rocky shores, and therefore are seldom seen beyond Massachusetts, in which state indeed they are exceedingly rare.

None were observed by any members of my party on the Magdalene

Islands, or on the coasts of Labrador or Newfoundland. I never met with any of them on the Mississippi above New Orleans, although they are plentiful in that neighbourhood during winter, and until the breeding season commences; and I think that this species never travels beyond the influence of the tide-waters of any stream. WILSON, in speaking of it, says that it is seen on the newly ploughed fields, and around the houses of the farmers of New Jersey; but the habit of visiting ploughed grounds I have not observed in any one of the American Gulls, although I have frequently noticed it in some of the European species, particularly *Larus canus*, *L. ridibundus*, and *L. argentatus*.

At all periods of the year, the Black-headed Gulls keep in flocks formed of many families; and in the breeding season, or even as soon as their courtships have commenced, they assemble by hundreds of pairs, or even by thousands. At this time they are so clamorous as to stun your ear with their laughing-like cries, though at other seasons they are generally silent, unless when suddenly alarmed, or when chased by the Jager. Their loves are conducted with extreme pomposity; they strut and bow to the females, throwing their head backwards, like all other Gulls, although in a less degree and with a less curious motion than Cormorants. You see them first stretching their heads forwards; then, with open bill, vibrating tongue, and eyes all glowing, they emit their loud laughing notes, which in a general sense resemble those of many other species, though they are not precisely similar to those of any. But before I proceed with my account of their manners, I will give you the result of some curious observations which I made on them in Florida.

Previously to my visit to that interesting peninsula, I had not unfrequently noticed indications of strong amatory propensities in several species of Gulls, but never to the extent exhibited by the present species, many of which I saw copulating in the latter part of autumn and in winter, fully three months before the usual time of depositing their eggs in that country. Similar observations were made on *Larus argentatus*, on the coast of Maine, and on *Larus marinus*, in the Bay of Fundy. Nay, even in Europe I have seen this extraordinary tendency to reproduce out of season, as it were. On some such occasions, when I was at St. Augustine, in the month of December, I have observed four or five males of the present species paying their addresses to one female, who received their courtesies with evident welcome. Yet the females in that country did not deposit eggs until the 20th day of April. The most surprising fact of all was, that, although these birds were paired, and copulated regularly, by the 1st of February, not one had acquired the spring or summer plumage, or the dark coloured hood, or the rosy tint of the breast, nor lost the white spots on the tips of their primary quills.

This change, however, was apparent by the 5th of March, became daily stronger, and was perfected by the 15th of that month. A few exceptions occurred among the numbers procured at these periods, but the generality of the birds were as above described.

While at Great Egg Harbour, in May, 1829, shortly after my return from England, I found this species breeding in great numbers on the margins of a vast salt marsh, bordering the sea-shore, though separated from the Atlantic by a long and narrow island. About sunrise every morning, an immense number of these birds would rise in the air, as if by common consent, and wing their way across the land, probably intent on reaching the lower shores of the Delaware river, or indeed farther towards the head waters of Chesapeake Bay. They formed themselves into long straggling lines, following each other singly, at the distance of a few yards. About an hour before sunset, the same birds were seen returning in an extended front, now all silent, although in the morning their cries were incessant, and lasted until they were out of sight. On arriving at the breeding-ground, they immediately settled upon their nests. On a few occasions, when it rained and blew hard, the numbers that left the nests were comparatively few, and those, as I thought, mostly males. Instead of travelling high, as they were wont to do in fair and calm weather, they skimmed closely over the land, contending with the wind with surprising pertinacity, and successfully too. At such times they were also quite silent. I now and then observed some of them whilst on wing, and at a considerable height, suddenly check their course, as if to examine some object below; but on none of these occasions did I see one attempt to alight, for it soon resumed its wonted course, and rejoined its companions.

Now, reader, though I am growing old, I yet feel desirous of acquiring knowledge regarding the habits of our birds, and should much like to learn from you the reasons why these Gulls went off in lines from their breeding-grounds, and returned in an extended front? Was it, in the latter case, because they were afraid of passing their nests unknowingly; or, in the former, under the necessity of following an experienced leader, who, under the stimulus of an empty maw, readily undertook the office, but who, like many other bon-vivants, became in the evening too dull to be of use to his companions?

This species breeds, according to the latitude, from the 1st of March to the middle of June; and I have thought that on the Tortuga Keys, it produced two broods each season. In New Jersey, and farther to the eastward, the nest resembles that of the Ring-billed Gull, or Common American Gull, *Larus zonorhynchus*, being formed of dried sea-weeds and land plants, two and sometimes three inches high, with a regular rounded

cavity, from four and a half to five inches in diameter, and an inch and a half in depth. This cavity is formed of finer grasses, placed in a pretty regular circular form. I once found a nest formed as it were of two; that is to say, two pairs had formed a nest of nearly double the ordinary size, and the two birds sat close to each other during rainy weather, but separately, each on its own three eggs. I observed that the males, as well as the females, thus concerned in this new sort of partnership, evinced as much mutual fondness as if they were brothers. On the Tortugas, where these Gulls also breed in abundance, I found their eggs deposited in slight hollows scooped in the sand. Whilst at Galveston, in Texas, I found their nests somewhat less bulky than in the Jerseys, which proved to me how much birds are guided in these matters by differences in atmospheric temperature and locality.

I never found more than three eggs in a nest. Their average length is two inches and half an eighth, their greatest breadth a trifle more than an inch and a half. They vary somewhat in their general tint, but are usually of a light earthy olive, blotched and spotted with dull reddish-brown and some black, the markings rather more abundant towards the larger end. As an article of food, they are excellent. These Gulls are extremely anxious about their eggs, as well as their young, which are apt to wander away from the nest while yet quite small. They are able to fly at the end of six weeks, and soon after this are abandoned by their parents, when the old and young birds keep apart in flocks until the following spring, when I think the latter nearly attain the plumage of their parents, though they are still smaller, and have the terminal band on the tail.

The Black-headed Gull frequently associates with the Razor-billed Shearwater, *Rhynchops nigra*, in winter; and I can safely say that I have seen more than a thousand of each kind alight on the same points of estuaries and mouths of rivers; the Gulls standing or sitting by themselves, at no great distance from the Razor-bills. Now and then they would all suddenly rise on wing as if frightened, perform a few evolutions in the air, and again settle on the very same spot, still, however, keeping separate. While thus in the company of the Razor-bills, the Gulls are with great difficulty approached, the former being exceedingly wary, and almost always rising when a person draws near, the Gulls immediately following them, and the two great flocks making off to some distant point, generally not very accessible. If taken up on being wounded, these Gulls are apt to bite severely. If, on being shot at, they fall on the water, they swim fast and lightly, their companions all the while soaring above, and plunging towards them, as if intent on rescuing them. This great sympathy often proves fatal to them, for, if the gunner is

inclined, he may shoot them down without any difficulty, and the more he kills the more his chances are increased.

On the 10th of May, 1832, it was my good fortune to be snugly on board the "Lady of the Green Mantle," or, in other words, the fine revenue cutter Marion. The Gulls that laughed whilst our anchors were swiftly descending towards the marvellous productions of the deep, soon had occasion to be sorrowful enough. As they were in great numbers, officers and men, as well as the American woodsman, gazing upon them from the high decks of the gallant bark, had ample opportunities of observing their motions. They were all busily engaged on wing, hovering here and there around the Brown Pelicans, intent on watching their plunges into the water, and all clamorously teasing their best benefactors. As with broadly extended pouch and lower mandible, the Pelican went down headlong, so gracefully followed the gay rosy-breasted Gull, which, on the brown bird's emerging, alighted nimbly on its very head, and with a gentle stoop instantly snatched from the mouth of its purveyor the glittering fry that moment entrapped!

Is this not quite strange, reader? Aye, truly it is. The sight of these manœuvres rendered me almost frantic with delight. At times, several Gulls would attempt to alight on the head of the same Pelican, but finding this impossible, they would at once sustain themselves around it, and snatch every morsel that escaped from the pouch of the great bird. So very dexterous were some of the Gulls at this sport, that I have seen them actually catch a little fish as it leaped from the yet partially open bill of the Pelican. And now, reader, I will conclude this long article with some fragments from my journals.

Tortugas, May, 1832.—Whilst here, I often saw the Black-headed Gull of WILSON, sucking the eggs of *Sterna fuliginosa*, and *Sterna stolida*. Our sailors assured me that these Gulls also eat the young of these two species of Terns when newly hatched.

Great Egg Harbour, May, 1829.—Like all other Gulls, the *Larus Atricilla* disgorges its food when attacked by a Lestris, or when wounded, or suddenly surprised; but on all occasions of respite this Gull is apt to return to it, and vulture-like to swallow it anew. It differs however from the larger species of Gulls, by never, as far as I have observed, picking up bivalve shells, for the purpose of letting them fall to break them, and afterwards feed on their contents. On the ground they walk with considerable alertness, and not without a certain degree of elegance, especially during the love season. Whilst floating or swimming on the water, they are graceful in a high degree, and when seen, as they oftentimes are, in groups of many pairs, rising with, or sinking amidst the billows, which ever and anon break on the sandy shores of the coast, their alternate appearance

brings to the mind of the bystander ideas connected with objects altogether different from the simple yet beautiful Laughing Gull.

April 1, 1837.—South-west pass of the Mississippi. *L. Atricilla* abundant here at this season, as well as at New Orleans. Saw some floating on logs during a heavy breeze. Not noisy yet, though they and *L. zonorhynchus* are in full spring dress (the old birds).

Barataria Bay, April, 1837.—This species is abundant, following the porpoises, whilst the latter are fishing, and attending on them, as they do on the Brown Pelicans, which I saw here tormented by these birds, as in the Floridas. These Gulls follow the Brown Pelicans to their roosts, and along with them sit on grounded logs, at some distance from the shores, to avoid the attacks of racoons and other carnivorous animals.

Galveston Bay, April 26, 1837.—Black-headed Gulls are not unfrequently seen hovering over the inner ponds of these islands, as if in search of food. They are now all paired, and very noisy.

May 4.—I observed to-day that at the single cry of a Black-headed Gull, all others within hearing at once came towards the caller, and this never failed when any of them had found floating garbage on which to feed. These, as well as all other Gulls, pat the water with their feet, their legs being partially extended, whilst assisting themselves with the bill to pick up any floating food. At this time the whole group emit a more plaintive single note than usual. They come not unfrequently within a few yards of our vessel at anchor, and when the food thrown to them is exhausted, they separate, and at once renew their repeated cries. I observed that the few immature birds among the old ones, were quite silent even when in the company of the adults. When the young are nearly able to fly, they are by no means bad eating.

Black-headed Gull, *Larus ridibundus*, Wils. Amer. Orn., vol. ix. p. 89.
Larus atricilla, Bonap. Syn., p. 359.
Black-headed Gull, Nutt. Man., vol. ii. p. 291.
Black-Headed or Laughing Gull, *Larus atricilla*, Aud. Orn. Biog., vol. iv. p. 118.

Adult, 17, 40¾.

Most abundant from Texas to Massachusetts, breeding along the coast. Up the Mississippi to New Orleans. Those which in spring remove to the eastward of the Floridas return early in autumn.

Adult Male in spring.

Bill rather shorter than the head, nearly straight, moderately stout, compressed. Upper mandible with its dorsal outline straight to the middle, then curved and declinate, the ridge convex, the sides rapidly sloping, the

edges sharp and direct, the tip rather obtuse but sharp-edged. Nasal groove rather long and narrow; nostrils in its fore part, longitudinal, sub-medial, large, linear-oblong, broader anteriorly, pervious. Lower mandible with the angle long and pointed, the outline of its crura decurved anteriorly, that of the ridge slightly concave and ascending, the sides erect and nearly flat.

Head of moderate size. Neck of ordinary length. Body compact. Feet rather long, stoutish; tibia bare below for three-fourths of an inch, covered behind with narrow scutella; tarsus compressed, anteriorly covered with numerous curved scutella, laterally with small oblong scales, posteriorly with small scutella. Toes slender, of moderate length, covered above with numerous scutella; first extremely small, second much shorter than fourth, third two-twelfths of an inch longer than the latter; anterior toes connected by reticulated webs, the outer and inner slightly marginate; claws small, slightly arched, compressed, thin-edged, that of the middle toe with an expanded inner margin.

Plumage close, soft, and blended. Wings very long and pointed; primaries tapering to a rounded point; first longest, second a twelfth of an inch shorter, the rest rapidly diminishing; secondaries broad, incurvate, and obliquely rounded, the inner straight and more elongated. Tail of moderate length, even, of twelve broad, rounded feathers.

Bill and feet, as well as the margin of eyelids, and the inside of the mouth, of a rich deep carmine; claws brownish-black. Iris bluish-black. The head and a portion of the upper part of the neck all round, blackish lead-grey, darker on the upper part of the head and along the posterior margin, which descends lower in front, or to the extent of about two inches and a half from the base of the lower mandible; two narrow white bands bordering the upper and lower eyelids. Lower neck all round, the whole surface, the rump and tail, pure white; but the fore part of the neck and the breast, down to the legs, of a beautiful light rosy tint. The back and wings are greyish-blue, with a very slight tinge of purple, excepting a large terminal portion of the secondaries, and the tips of the primaries, which are white. The first primary is black, with a tinge of grey on the inner web at the base; the second and third similar, with the grey more extended; on the fourth it extends over two-thirds; the fifth is black only for an inch and a half; and on the sixth the black is reduced to two spots near the end; the other parts and the remaining primaries of the same general colour as the back.

Length to end of tail 17 inches, to end of wings 20, to end of claws 17; extent of wings $40\frac{3}{4}$; wing from flexure $12\frac{10}{12}$; tail $5\frac{3}{12}$; bill along the ridge $1\frac{11}{12}$, along the edge of lower mandible $2\frac{1}{4}$; tarsus 2; hind toe and claw $\frac{4}{12}$; middle toe and claw $1\frac{9}{12}$; outer toe and claw $1\frac{1}{2}$; inner toe and claw $1\frac{3}{12}$.

The female is precisely similar to the male, but considerably smaller.

In winter the head is white, the feathers on its upper part and on the nape more or less brownish-grey in their concealed part, that colour appearing in slight patches here and here, and especially along the posterior margin of the part that is coloured in summer, as well as on a small space before the eye. The rosy tint of the breast disappears after the breeding season. In other respects the plumage is as in summer.

Young fully fledged.

Bill, feet, inside of mouth, and edges of eyelids, olivaceous-brown. The upper parts are brownish-grey, the feathers edged with paler; the hind part of the back light bluish-grey; upper tail-coverts nearly white; tail pale greyish-blue, with a broad band of brownish-black at the end, the extreme tips narrowly edged with white, the outer margin of the lateral feathers of the same colour. The first four primaries are destitute of white at the tip. A smaller patch before the eye, two slight bands on the eyelids, and the throat, greyish-white; the lower part of the neck brownish-grey, the rest of the lower parts greyish-white, the sides darker, the axillars ash-grey, the lower surface of the wing dusky-grey.

In an adult male the tongue is 1¼ inches long, slender, tapering, emarginate at the base, with minute papillæ, the tip horny along the back. The œsophagus is 6½ inches long, 5 twelfths in diameter until it enters the thorax, then dilates to 1 inch and 5 twelfths; its walls are extremely thin, its inner coat longitudinally plaited. Proventriculus very short, the belt of oblong glandules being only 7 twelfths in breadth. Stomach rather small, oblong, 1½ inches long, 10 twelfths broad; its lateral muscles rather thick, the tendons large; the inner coat thick, horny, and thrown into very prominent longitudinal rugæ, its upper margin abrupt, and manifestly not continuous with the inner coat of the proventriculus, as some have supposed the epithelium to be in all birds. In the stomach remains of fishes. Intestines 1 foot 9½ inches long, its general diameter ¼ inch. Rectum 1½ inches; cœca extremely small, 2½ twelfths long, ½ twelfth in diameter.

Trachea 5½ inches long; its rings 110, extremely thin and feeble; its diameter at the top 4½ twelfths, at the lower part 2½ twelfths. The lateral muscles are scarcely perceptible, the sterno-tracheal very slender; the inferior larynx small; the bronchi of moderate length and width, with 25 half-rings.

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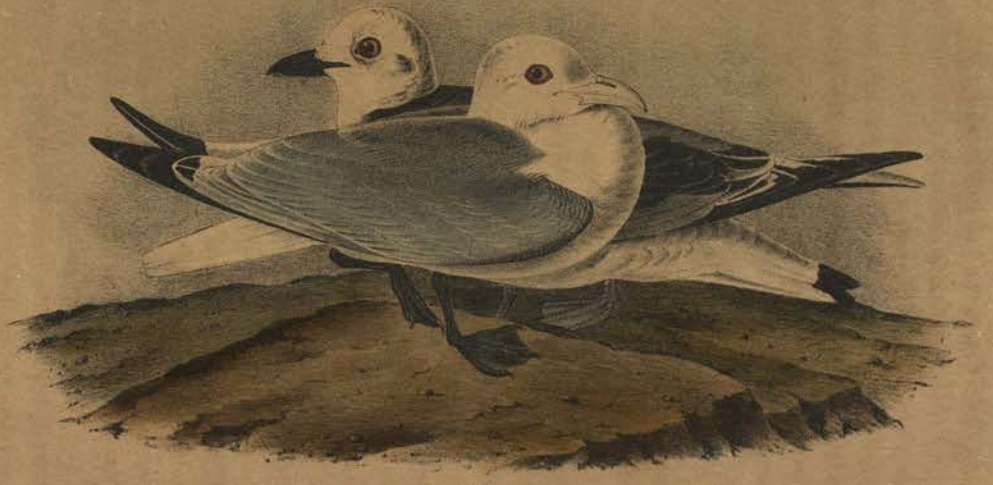

Kittiwake Gull?

Drawn from Nature by J.J. Audubon, FRSELS.

1. Adult - 2. Young.

Lith.ª Printed & Col.ª by J. T. Bowen, Philad.ª

FRANKLIN'S ROSY GULL.

LARUS FRANKLINII, *Richardson.*

(NOT FIGURED.)

The following account of this species by Dr. RICHARDSON is taken from the Fauna Boreali-Americana.

"Franklin's Rosy Gull, with vermilion bill and feet; mantle pearl-grey; five exterior quills broadly barred with black, the first one tipped with white for an inch; tarsus twenty lines long; hood black in summer.

"This is a very common Gull in the interior of the Fur Countries, where it frequents the shores of the larger lakes. It is generally seen in flocks, and is very noisy. It breeds in marshy places. ORD'S description of his Black-headed Gull (Wils. ix. p. 89) corresponds with our specimens, except that the conspicuous white end of the first quill is not noticed: the figure (Pl. 74, fig. 4) differs in the primaries, being entirely black. The Prince of MUSIGNANO gives the totally black primaries and a tarsus nearly two inches long, as part of the specific character of his *Larus Atricilla*, to which he refers WILSON'S bird; though, in his *Observations*, he states that the adult specimens have the primaries, with the exception of the first and second, tipped with white. *L. Franklinii* cannot be referred either to the *L. Atricilla* or *L. melanocephalus* of M. TEMMINCK: the first has a *lead-coloured hood* and deep black quill-feathers, untipped by white; and the *black* hood of the second does not descend lower on the throat than on the nape; its quill-feathers are also differently marked, and its tarsus is longer. His *L. Ridibundus* and *L. capistratus* have brown heads, and the interior of the wings grey; the latter has also a much smaller bill than our *L. Franklinii*.

"Description of a male killed June 6, 1827, on the Saskatchewan.

"Colour.—Both eyelids, the neck, rump, tail, and whole under plumage, white, the latter and interior of the wings deeply tinged with peach-blossom red. Black hood covering three-quarters of an inch of the nape, and extending as much lower on the throat. Mantle and wings bluish-grey. The outer web of the first quill-feather is black to near the tip, and a broad band of the same crosses the ends of the five outer primaries; all the quill-feathers are terminated with white, that on the first primary and of all the

secondaries being upwards of an inch long; all the shafts whitish. Bill and legs vermilion, the former obscurely barred near the tip.

"Form.—Bill rather stout, curved from the nostrils, with the gonys forming an evident salient angle; its depth equal to twice its breadth. Wings an inch and a half longer than the perfectly even tail. Thighs an inch bare.

"A female and another male, killed at the same place six weeks later in the season, correspond minutely with the above.

"Dimensions of a male. Length to end of tail 17 inches; tail $4\frac{1}{2}$; wing 11; bill along the ridge $1\frac{5}{12}$; rictus $1\frac{11}{12}$; tarsus $1\frac{8}{12}$; middle toe $1\frac{3}{12}$, its nail $\frac{4}{12}$; inner toe 1; hind toe $\frac{3}{12}$, its nail $\frac{1}{12}$."

LARUS FRANKLINII, *Franklin's Rosy Gull*, Swains. and Rich. F. Bor. Amer., vol. ii. p. 424.

FRANKLIN'S ROSY GULL, *Larus Franklinii*, Aud. Orn. Biog., vol. v. p. 323.

Male, 17, wing, 11.

Interior of Fur Countries, breeding on the edges of large lakes.

THE KITTIWAKE GULL.

LARUS TRIDACTYLUS, *Linn.*

PLATE CCCCXLIV.—ADULT IN SUMMER, AND YOUNG IN WINTER.

This beautiful Gull ranges, during the autumnal and winter months, along the whole of our extensive coasts. I have procured it from the mouth of the Mississippi to the coast of Maine, and have traced it from the latter district to Labrador. Yet I never saw it on any of our great lakes or rivers, nor in any part of the interior. From New York to Eastport it is extremely abundant, and many breed on the Island of Grand Manan, off the entrance of the Bay of Fundy.

As we approached the famous Gannet Rock of the Gulf of St. Lawrence, the wind suddenly rose to a gale; but as I was exceedingly anxious that a landing should be effected on the island, every exertion was made to enable me to accomplish my purpose. The whale boat was manned. THOMAS

LINCOLN and my son leaped into it, accompanied by young COOLEDGE. Urged by strong pulls, the buoyant boat advanced towards the grim rock. For nearly an hour it became hidden from my sight; but now and then the report of a gun brought intimation that all was as yet safe; and at length I had the great pleasure of seeing it advancing towards the Ripley, which stood off and on, shivering as it were under the heavy blast. My eye fixed to the telescope, watched every movement of the boat, as with fear I saw it tossed from billow to billow, this moment a glimpse of her keel appearing over the edge of a wave, the next a foot of her stem only seeming to float on the waters. "Pull steadily on, my good lads," at last came on my ear, when, by a heavy surge, the floating shell was driven back some twenty yards, as I thought, and the wave, foaming with wrath, broke over her. Breathless and exhausted, the crew at length came within reach of a line, as the boat was dangerously plunging, when by good luck the rope was thrown across her, and in a few moments she lay snug under our lee. How happy was I when I again saw my son, my young companions, and the sailors, on the deck of the Ripley. Quickly was the whaler hauled on board, and with joy we saw our vessel fly off like a Kittiwake before the gale.

When the anxiety was over, inquiries were made as to the success of the adventurous party. Several nests of the Kittiwake and many of its eggs had been brought safe on board. Notes had been taken on the spot, and the result of the expedition was as follows:—The nests were found placed on some ledge of the huge rock, so small as barely to admit their breadth, which was about a foot. They were placed where no other bird than the Guillemot would have ventured to drop its egg, or the Raven to fix his nest. Yet on that narrow platform the Kittiwake sat on its three eggs, as unconcerned as if in a meadow. The nests were altogether composed of sea-weeds called "eel-grass," and coarse grasses, probably procured on the top of the rock, or stolen from the nest of some unwary Solan Goose. Their inner surface was quite flat, although some of the nests were many inches in thickness, and looked as if they had been increased in bulk year after year. The sitting birds remained on their eggs with uncommon pertinacity, seldom indeed flying off, but merely moving aside. The male birds, or those that had no eggs, on the contrary, were extremely clamorous, flew around the party in great concern, and shewed much courage. The eggs are of a light olive-green colour, marked with numerous irregular spots of dark brown. Their average length is two inches and a quarter, their greatest breadth one inch and seven-eighths. No other species of Gull was seen about the rock; and indeed I have regularly observed that each species of this genus breeds far apart, although at all other seasons it may associate with others.

The young remain a considerable time in the nest or about it, when room

is afforded. Their bills and feet are now quite black, the eye dark, and they do not change these colours until the second spring after their birth, when the bill is dull yellow, the legs and feet of a greenish flesh-colour, and these parts gradually improve in their tints until they acquire the appearance represented in the plate. This species raises only one brood in the season, and old and young leave the coast of Labrador at the first appearance of winter, or when the Ivory Gull reaches that country. This, however, I know only from hearsay, having received the information from a settler at Bras d'Or, who has lived there many years, and must know something of both species, as he was in the habit of salting young Kittiwakes for winter provisions, along with those of other species, and of shooting the Ivory Gull when it arrived over his harbour in the month of December.

The Kittiwake is on land the most awkward of its tribe; and, although it walks often on the rocks, its gait manifests a waddling gaucherie; but on the water, or in the air, few birds surpass it in buoyancy, grace, and ease of motion. Bearing up against the heaviest gale, it passes from one trough of the sea to another, as if anxious to rest for an instant under the lee of the billows; yet as these are seen to rear their curling crests, the Gull is already several feet above them, and preparing to plunge into the next hollow. While in our harbour, and during fine weather, they seemed to play with their companions of other species. Now with a spiral curve, they descend toward the water, support themselves by beats of their wings, decline their heads, and pick up a young herring or some bit of garbage, when away they fly, chased perhaps by several others anxious to rob them of the prize. Noon has arrived. High above the mast-head of our largest man-of-war, the Kittiwakes float gracefully in wide circles, until all, as if fatigued, sail downward again with common accord towards the transparent deep, and, alighting close to each other, seem to ride safely at anchor. There they now occupy themselves in cleaning and arranging their beautiful plumage.

The food of this species consists of small fish, sea insects, and small bivalves, most of which they procure while on wing, even those left dry by the tide. Unlike the larger species, they do not take up shell-fish to break them by letting them fall on the rocks; at least I never saw them do so. Their principal enemies are different species of Lestris, especially that beautiful one named the *L. parasiticus*. This tormentor follows the Kittiwake to the very waters around the Gulf of Florida during the winter. There, with astonishing swiftness, and an audacity scarcely to be surpassed, it gives chase to the Gull, overtakes it, and forces it to alight on the water, or to disgorge the fish which it has just swallowed.

The two represented in the plate were drawn at Boston, at the approach of spring, when the old birds had already assumed the pure white of the

head. This species was so abundant on several of the islands of the Bay of Boston, that several basketfuls of them were procured in the course of a few excursions. When one fell to the water, the rest would hover about and around the boat, until many were shot from a flock. The case was the same while we were in some of the harbours of Labrador.

Larus tridactylus, Bonap. Syn., p. 359.
Larus tridactylus, *Kittiwake*, Swains. and Rich. F. Bor. Amer., vol. ii. p. 423.
Kittiwake, Nutt. Man., vol. ii. p. 298.
Kittiwake Gull, *Larus tridactylus*, Aud. Orn. Biog., vol. iii. p. 186.

Adult, 18, 36½.

Common as far south as New York. Abundant from Massachusetts eastward. Breeds from the Bay of Fundy northward.

Adult in summer.

Bill shorter than the head, strong, nearly straight, compressed. Upper mandible with the dorsal line nearly straight and slightly declinate, until towards the end, when it is decurved, the ridge convex, the sides slightly convex, the edges a little inflected, straight, towards the end declinate and arched, the tip rather obtuse. Nasal groove narrow, rather long; nostril in its fore part, lateral, longitudinal, linear, wider anteriorly, open, and pervious. Lower mandible with a slight prominence at the end of the angle, which is long and narrow, the dorsal line then nearly straight and ascending, the sides convex, the edges sharp and inflected.

Head rather large, oblong, anteriorly compressed. Neck of moderate length. Body rather full. Wings long. Feet of moderate length, rather strong; tibia bare below; tarsus somewhat compressed, covered before and behind with numerous broad scutella, the sides reticulated; hind toe rudimentary, with a minute knob in place of the claw; the fore toes rather long and slender, the fourth longer than the second, all scutellate above, and connected by reticulated entire membranes, the lateral toes margined externally with a narrow membrane. Claws small, compressed, slightly arched, rather obtuse.

The plumage in general is close, elastic, very soft and blended, on the back somewhat compact. Wings very long, rather broad, acute, the first quill longest, the other primaries rapidly graduated; secondaries broad and rounded, the inner elongated and narrow. Tail of moderate length, even, of twelve rounded feathers.

Bill pale greenish-yellow. Edges of eyelids crimson; iris reddish-brown. Feet black. The head, neck, rump, tail, and lower parts generally are pure white. The back and upper surface of the wings light pearl-grey. The

first five quills are black at the end, the first on its outer web also, the fifth with a small white tip, the tips of all the other quills more or less white.

Length to end of tail 18 inches, to end of wings 20, to end of claws 17; extent of wings 36½; wing from flexure 12; tail 7; bill along the back 1½, along the edge of lower mandible $2\frac{2}{12}$; tarsus $1\frac{7}{12}$; middle toe 1½, its claw $\frac{4}{12}$. Weight 1½ lbs.

Young bird in January.

Bill and feet black. Edges of eyelids and iris as in the adult. The hind head and neck are bluish-grey, and before the eye there is a semi-lunar blackish mark, the tips of the auriculars also dark grey. Forehead, sides of the head, throat, and lower parts, white, as is the rump. Tail white, with a broad terminal band of black, the outer feather having only a spot on the inner web. The mantle is bluish-grey, but a broad band of black crosses the lower part of the hind neck, and the larger wing-coverts are of the same colour towards the end. The primary quills are black, more or less margined with white internally.

Length to end of tail 17 inches, to end of wings 19, to end of claws 17; extent of wings $36\frac{3}{12}$. Weight 14½ oz.

THE IVORY GULL.

LARUS EBURNEUS, *Gmel.*

PLATE CCCCXLV.—ADULT AND YOUNG.

Having ascertained that this beautiful species visits the southern coast of Labrador and Newfoundland every winter, I have thought it probable that it occasionally extends its rambles as far as our eastern shores, and therefore determined to include it in my Illustrations. The figures in the plate were taken from two specimens procured by Captain JAMES CLARK ROSS, one of which was an adult male, the other a young bird in its second year. Captain SABINE says that the Ivory Gulls are attracted in considerable numbers by whale blubber, are therefore usually found in company with the *Procellaria glacialis*, and are easily killed, being by no means shy. Dr. RICHARDSON informs us that they were observed breeding in great numbers on the high perforated cliffs which form the extremity of Cape Parry, in latitude 70°.

Ivory Gull.

Drawn from Nature by J. J. Audubon F.R.S.F.L.S. 1 Adult Male 2 Young second Autumn Lith.d Printed & Col.d by J. T. Bowen Phil.d

LARUS EBURNEUS, Bonap. Syn., p. 360.

LARUS EBURNEUS, *Ivory Gull*, Swains. and Rich. F. Bor. Amer.

IVORY GULL, Nutt. Man., vol. ii. p. 301.

IVORY GULL, *Larus eburneus*, Aud. Orn. Biog., vol. iii. p. 571

Adult, 19, 41.

Accidental on the coast of the United States. Common in winter in Labrador and Newfoundland. Breeds in high latitudes.

Adult Male.

Bill shorter than the head, robust, nearly straight, compressed. Upper mandible with the dorsal line nearly straight at the base, arched and declinate towards the end, the ridge convex, the sides slightly so, the edges sharp, a little inflected, somewhat arched, the tip rather obtuse. Nasal groove rather long and narrow; nostrils in its fore part, lateral, longitudinal, linear, wider anteriorly, pervious. Lower mandible with a prominence at the end of the angle, which is long and narrow, the dorsal line slightly concave and ascending, the sides flattened, the edges sharp and inflected.

Head rather large. Neck of moderate length, strong. Body rather full. Feet of moderate length, stout; tibia bare below; tarsus somewhat compressed, covered before with numerous scutella, on the sides and behind with series of small angular scales; the hind toe very small and elevated, the fore toes of moderate length, the fourth much longer than the second, the third longest, the hind one with a single scutellum and three transverse series of scales, the rest scutellate above and connected by reticulate membranes having a concave margin, the lateral toes margined externally with a narrow membrane. Claws stout, rather large, arched, compressed, rather obtuse, that of middle toe with an enlarged inner edge.

The plumage in general is close, full, elastic, soft and blended, on the back rather compact. Wings very long, rather broad, acute, the first quill longest, the other primaries rapidly graduated; secondaries broad and rounded, the inner tapering but rounded. Tail of moderate length, even, of twelve rather broad rounded feathers.

Bill bright yellow, greenish-dusky at the base. Iris brown, edges of eyelids vermilion. Feet and claws black. The whole of the plumage is pure white.

Length to end of tail 19 inches, to end of wings $20\frac{1}{2}$; extent of wings 41; wing from flexure $13\frac{1}{2}$; tail $6\frac{1}{4}$; bill along the back $1\frac{5}{12}$, along the edge of lower mandible 2; tarsus $1\frac{7}{12}$; middle toe $1\frac{2}{12}$, its claw $\frac{5}{12}$. Weight 20 oz.

Young of the second year, killed in September.

After the second moult, the bill is pale yellow at the end, dusky at the base for two-thirds of its length; the edges of the eyelids vermilion, the iris brown, the feet black. The plumage is white; the forehead and sides of the

head mottled with leaden-grey; most of the wing-coverts have towards the end a spot of greyish-black, and the quills, large coverts, and tail-feathers are similarly marked, the markings on the tail forming a subterminal bar.

THE COMMON AMERICAN GULL.

LARUS ZONORHYNCHUS, *Richardson.*

PLATE CCCCXLVI.—ADULT MALE, AND YOUNG IN WINTER.

No country can afford greater facilities for the migration of water-birds than the United States of America. Even the Gulls are enabled to traverse their whole extent from north to south, and in the contrary direction, without suffering from want of food or of proper resting places. The Gull that has been bred in Labrador, or still farther north, can reach the Gulf of Mexico without being seriously incommoded by the storms that now and then rage along the Atlantic coast. The broad waters of the St. Lawrence lead it to our great lakes, from which hundreds of streams conduct it to the head waters of the Ohio or the Mississippi, by following the windings of which it at length arrives in the warm regions of the Mexican Gulf, on whose waters the traveller can spend the winter. That these advantages are embraced by many species of Gull, there can be no doubt; and should you, as I have done, repeatedly visit our broad lakes, or the great rivers just mentioned, you would find there, at particular seasons, not only this species, but several others, as well as various kinds of Terns, but none of the genus Lestris. Lake Erie supplies with food the *Larus marinus*, *L. Argentatus*, *L. atricilla*, and some others, as well as the Great, the Arctic, the Roseate, and the Black Terns, all of which pass at times over to the Ohio, and from thence to the ocean. During these inland movements, the birds seem to be peculiarly attracted by certain places, at which they remain for awhile. Thus, at the Falls of the Ohio, some species remain for weeks, and wherever much shipping occurs on that river or the Mississippi, Gulls are sure to be seen gleaning the garbage that has been thrown overboard, or seizing such fishes as rise incautiously to the surface of the water. 'In the months of September and October, Gulls and Terns might almost be said to abound on

Common American Gull. Ring-billed Gull.

1 Adult 2 Young

Drawn from Nature by J.J. Audubon F.R.S.F.L.S.

Lith.d Printed & Col.d by J. T. Bowen Phila.d

our great streams, and many return thither during the spring months on their way northward. Nay, to some species of Tern, the beautiful sand-bars and rocky beaches that occur here and there, are so attractive as to induce a few to remain and breed there. This is especially the case with the Black Terns, some of which rear their young by the rapids of the Ohio below Louisville, amidst the roaring sounds of which may be heard their shrill and continued cries.

You must not suppose, however, that all the Gulls which migrate in that country take the same route; for thousands follow the sinuosities of our Atlantic coast, some of them perhaps proceeding as far south in that direction as those which follow our rivers. My opinion is, that the feebler individuals of the different species follow the inland route, while the older and more hardy birds keep along the shores of the ocean. The examination of numerous specimens on both of these extensive tracks has almost rendered this a matter of certainty, yet I should be much pleased to find this opinion corroborated by the observations of any other student of nature.

While on the coast of Florida, in the winter of 1832–33, I every day saw Gulls of many species, but among them all were no adult birds, with the exception of the Black-headed Gull of WILSON, which was very abundant. This greatly tended to strengthen my opinion, that the young Gulls are of more delicate constitutions than their parents, which are better enabled to stand the rigours of the winter in the Middle States, where they are found equally abundant at that season. For similar reasons, I also feel assured that the oldest birds are those which go farthest north to breed, and that the older and stronger individuals are larger, with more purely tinted plumage, and with the colours of their legs, feet and bills, as well as of the circle around the eye, more vivid than those which, although found breeding, yet have not acquired their full maturity. In consequence of these circumstances, some species have been described as forming several, and the great difference between the plumage of the young and the old birds has led to similar errors.

Our Common Gull is seldom seen in the adult plumage of winter beyond the shores of Maryland southward, or in full summer plumage beyond the Bay of New York, and this rarely after the middle of April, as at that period they gather into flocks, and remove farther north to breed. The places to which this species resorts for that purpose, and which I have visited, are several islands between Boston and Eastport, another close to Grand Manan at the entrance of the Bay of Fundy, the Great Gannet Rock of the Gulf of St. Lawrence, and certain rocky isles in the deep bays on the coast of Labrador.

This species, although one of those most abundant on our coast, is so well acquainted with the artifices of man, that it keeps more than others beyond

the reach of the gun. While in our harbours or rivers it sails at a moderate height, sometimes mingling with the silvery Gull, or even with the Great Black-backed. Its movements are graceful and easy, and it floats as it were in the air, whether proceeding in a direct line, or in irregular curves, when, suddenly checking its speed, it partially closes its wings, and descends with rapidity in a spiral manner. As it approaches the water, it allows its legs to hang, opens its bill, and while seizing its food, raises its wings erect and flaps them quickly to support its body. Now with loaded bill it sweeps off to some distance, alights, and devours its prey.

When in pursuit of a shoal of small fish, it assembles in flocks, keeps up a constant yelping noise, dips every instant among the fry, and continues to feed until so gorged as to be unable to fly. Alighting in groups, they float with great buoyancy, and it is pleasant to see them rising and falling alternately on the waves of a moderately agitated sea, the snowy whiteness of their under parts contrasting with the deep green water, and their elongated wings extending beyond the tail, giving the appearance of lightness and agility to their form.

The flight of this species is light and long sustained, and the circumstance of birds of this genus being able to find food almost anywhere, induces them at times to proceed far out to sea; and I have now and then been gratified by the sudden appearance of several birds of the present species to the lee of the ship, on whose deck I was with impatience watching for the sight of land. The winged pilgrims would no sooner come up than they also would express their pleasure by their cries, especially when they received from the passengers bits of bread or such garbage as might be at hand. Once fed, they would fly about us the whole day, and sometimes would be seen the next; and then perhaps all at once, as if made aware of the existence of land in a particular direction, they would fly off, and we would see no more of them.

When spring has fairly commenced, our Common Gulls assemble in parties of hundreds, and alight on mud flats or sandy beaches, in our eastern estuaries and bays. For awhile they regularly resort to these places, which to the Gulls are what the scratching or tooting grounds are to the Pinnated Grouse. The male Gulls, however, although somewhat pugnacious, are not very inveterate in their quarrels, making up by clamour for the deficiency of prowess in their tournaments. The males bow to the females with swollen throats, and walk round them with many odd gesticulations. As soon as the birds are paired, they give up their animosities, and for the rest of the season live together on the best terms. After a few weeks spent in these preparatory pleasures, the flocks take to wing, and betake themselves to their breeding places.

On an island within a few miles of Eastport in Maine, I found these birds breeding in great numbers in the beginning of May. Their nests were there placed amid the scanty tufts of grass. On the Gannet Rock, early in June, they were breeding on the shelves towards the summit, along with the Guillemots, while the Kittiwakes had secured their nests far below. The different species kept apart, but yet exhibited no antipathy towards each other. On the 18th of July, we discovered a low rocky island at the bottom of a bay ten miles from the open sea, opposite the harbour of Little Macitana, on the coast of Labrador, where we found upwards of two hundred nests, all containing eggs with the chicks more or less advanced. The number of eggs in each nest was three or four, more generally three. They resembled those of the Great Black-backed Gull in form and colour, but were much smaller, measuring two inches and three-quarters in length, by one and five and a half eighths in their greatest diameter. There was considerable diversity both in the tint of their ground colour, and in the number and size of the spots on them, as is the case with the eggs of most water-birds. In general, however, they were of a dull dark cream-colour, thickly blotched, sprinkled and touched with different shades of purple, umber, and black. When fresh, these eggs are delicious food, as I have had abundant occasion to know. The nests were in this place all situated on the bare rock, but in all other respects resembled those found among the grass or on more elevated rocks; they were formed of sea-weeds, well constructed, about six inches across within, and twelve in their greatest diameter. Some of the nests were much thicker and larger than others; many were placed within the distance of a foot from each other; and the whole place was covered with feathers and dung, which emitted a very disagreeable stench, proving to us that it was annually resorted to by these birds. To our surprise the birds were very shy. Among those killed by us were some having all the appearance of mature age, such as I have mentioned above. The number of individuals among them having the black ring on the bill was much greater than among those found near Grand Manan; some, however, were without this ring, and on others it was but partially marked. Some had no white on the tips of the primaries, and differences were also observable in the length of the tarsus and toes; but all had the same voice, and were actually of the same species. We also found considerable differences in their size and weight, even in individuals of the same sex, some weighing one pound, others four ounces more, and some so much as one pound ten ounces. The males, at an average, were larger than the females. Not a bird of any other species was found there, or on the grassy islands.

Whatever opinion may be held as to the synonyms of this Gull, I am perfectly assured of the above mentioned variations in the colour, size, and

markings of the younger and older birds. I am equally sure that no individuals acquire the full beauty of the plumage before the third spring. The young are at first of a dull greenish-yellow, spotted with dark brown on the head and rump. In a very few days they leave the nest, ramble about in its vicinity, waiting the arrival of their parents with food, and conceal themselves under stones or in crevices at the appearance of danger. When a few weeks old, they do not hesitate, on being pursued, to betake themselves to the water, where they swim with great lightness. When about the size of pigeons, they assume a brownish colour, each feather being broadly banded or tipped with light ferruginous and grey. At this season, the fishermen of Labrador and Newfoundland kill them in great numbers, and pack them in salt for winter use. I was much surprised one morning while at Labrador, to see one of the barges of the Gulnare come alongside of the Ripley after a long cruise, when officers and men were glad to have a good mess of these young Gulls in the bow of their boat, they having run short of provisions.

LARUS CANUS, *Mew or Common Gull*, Swains. and Rich. F. Bor. Amer., vol. ii. p. 420.
LARUS ZONORHYNCHUS, *Ring-billed Mew-Gull*, Ibid., p. 421.
LARUS BRACHYRHYNCHUS, *Short-billed Mew-Gull*, Ibid., p. 422.
RING-BILLED MEW-GULL, Nutt. Man., vol. ii. p. 300.
COMMON AMERICAN GULL, *Larus zonorhynchus*, Aud. Orn. Biog., vol. iii. p. 98; vol. v. p. 638.

Adult, 20, 48.

Common during winter from Texas, along the coast, to Maine. Up the Mississippi to Natchez. Breeds from Maine to Labrador, Hudson's Bay, and Arctic shores. Columbia river. Migratory.

Adult Male in summer plumage.

Bill shorter than the head, robust, nearly straight, compressed. Upper mandible with the dorsal line nearly straight at the base, arched and declinate towards the end, the ridge convex, the sides slightly convex, the edges sharp, inflected, arched, the tip rather obtuse. Nasal groove rather long and narrow; nostrils in its fore part, lateral, longitudinal, linear, wider anteriorly, open, and pervious. Lower mandible with a prominence at the end of the angle, which is long and narrow, the dorsal line then nearly straight and ascending, the sides convex, the edges sharp and inflected.

Head rather large. Neck of moderate length. Body rather full. Wings long. Feet of moderate length, rather slender; tibia bare below; tarsus somewhat compressed, covered before and behind with numerous broad scutella, the sides reticulated; hind toe very small and elevated, the fore toes rather long and slender, the fourth longer than the second, the third longest,

all scutellate above, and connected by reticulated entire membranes, the lateral toes margined externally with a narrow membrane. Claws small, compressed, slightly arched, rather obtuse.

The plumage in general is close, elastic, very soft and blended, on the back rather compact. Wings very long, rather broad, acute, the first quill longest, the other primaries rapidly graduated; secondaries broad and rounded, the inner elongated and narrow. Tail of moderate length, even, of twelve rounded feathers.

Bill marked opposite the angle with a broad transverse band of brownish-black, between which and the base it is light greenish-yellow, the tips orange-yellow. Edges of eyelids greenish-yellow; iris bright yellow. Feet greenish-yellow, the webs tinged with orange; claws black. The general colour of the plumage is pure white, excepting the back and wings, which are light pearl-grey. The first six quills are black towards their extremities, the first and second being almost entirely so, the sixth with only a small spot. The tips of these feathers are white, that of the first having merely a narrow margin of that colour, which gradually enlarges on the rest, the first moreover has near the end a long patch of white, the second a smaller one on the inner web. The proportional size of the white marks on the outer primaries varies in individuals. The other quills and secondaries are all white at the ends.

Length to end of tail 20 inches, to end of wings 22¼, to end of claws 20½; extent of wings 48; wing from flexure 15½; tail 6; bill along the back 1¾, along the edge 2⅝, depth at the base $\frac{8}{11}$, depth at the prominence ½; bare part of the tibia ¾; tarsus 2; middle toe $1\frac{3}{11}$, its claw $\frac{2}{11}$; hind toe $\frac{2}{11}$, its claw $\frac{1}{11}$. Weight 1½ lbs.

Young bird, after first moult, shot on 26th November.

Bill black, base of lower mandible and edges of upper towards the base, livid flesh-colour. Edges of eyelids livid blue; iris hazel. Feet purplish-grey; claws brownish-black. The general colour of the plumage is dull white, mottled with greyish-brown beneath, on the back with large brownish-black spots, the dark markings being central. Anterior to the eye is a crescent of greyish-black. The outer primary quills are black, the two first without white at the ends, the rest margined round the ends with that colour. The abdominal and tibial feathers are white; the lower and upper tail-coverts white, with brown spots.

Length to end of tail 18⅜, to end of wings 20½, extent of wings 44½; tarsus 2; middle toe $1\frac{3}{11}$, its claw $\frac{2}{11}$. Weight 1 lb. 3 oz.

On a rocky island on the coast of Labrador, where this bird was breeding in great numbers, a comparatively small number of individuals only had the bill marked with the black ring, the others, although precisely similar in

other respects, wanted that mark. This bird, although in many respects precisely similar to that which is usually named *Larus canus* in Europe, differs greatly in the size of the bill, which even in young birds is much deeper than in the oldest individuals of that species.

Female, from Dr. T. M. BREWER. Mouth 1 inch 1 twelfth in width; palate with two very prominent papillate ridges, the space between which is covered with reversed papillæ, its anterior part with five prominent lines, and moderately concave; the posterior aperture of the nares oblong-linear, 11 twelfths in length. Tongue 1 inch 5 twelfths long, emarginate and finely papillate at the base; its sides nearly parallel as far as the middle, its breadth being 3 twelfths, then tapering to a narrow emarginate point, and trigonal. Œsophagus 7 inches long, extremely wide, its breadth being 1½ inches; that of the proventriculus 1 inch 9 twelfths. The stomach is rather small, elliptical, 1 inch 5 twelfths long, 1 inch 2 twelfths broad; its lateral muscles distinct and of moderate size, the lower prominent, the tendons large, the epithelium dense, with very prominent large rugæ; the inner coat of the œsophagus is longitudinally plicate; the proventricular belt 1 inch in breadth, with six broad plates. Intestine 30 inches long, its width at the upper part 5 twelfths, diminishing to 2½ twelfths, cœca 3 twelfths long, 1 twelfth broad, 3 inches distant from the extremity, rectum 5 twelfths broad, with a globular cloaca 9 twelfths in diameter. The duodenum curves at the distance of 2¼ inches, advances toward the liver in the usual manner, and is afterwards very regularly coiled in an elliptical form, with 10 bends. Trachea 5 inches long, from 3 twelfths to 2½ twelfths in breadth, not flattened, its rings slightly osseous, 130. Bronchi wide, of 20 half rings. The lateral and sterno-tracheal muscles are slender, and a slip on each side extends to the last half-ring of the trachea.

White winged Silvery Gull

1 Male in Summer 2 Young in Winter

Drawn from Nature by J.J. Audubon F.R.S.F.L.S.

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THE WHITE-WINGED SILVERY GULL.

LARUS LEUCOPTERUS, *Faber.*

PLATE CCCCXLVII.—ADULT MALE, AND YOUNG.

I have not met with this species farther south than the Bay of New York. During the winter it is not rare about Boston and farther eastward. At the approach of summer, before the pairing of the Herring Gull, *Larus argentatus*, the White-winged Gulls collect in flocks, and set out for the distant north, where they breed.

The flight of this species so much resembles that of the Herring Gull, that were it not for its smaller size, and the different colour of its wings, it could not be distinguished from the other. It is less shy, however, proceeds farther up the rivers and salt-water creeks, and alights oftener on the water as well as on the salt-meadows, than that species. While at Portland in Maine, I observed a good number of these Gulls flying over the inner harbour close to the shores, descending towards the water, and picking up garbage in the manner of the Herring Gulls, with which they associated. Their notes were not so loud, nor so often heard.

I was surprised to find but very few on the coast of Labrador, and these did not seem to be breeding, for although we carefully watched them, we did not succeed in finding any nests.

LARUS LEUCOPTERUS, Bonap. Syn., p. 361.

LARUS LEUCOPTERUS, *White-winged Silvery Gull*, Swains. and Rich. F. Bor. Amer., vol. ii. p. 418.

WHITE-WINGED SILVERY GULL, Nutt. Man., vol. ii. p. 305.

WHITE-WINGED SILVERY GULL, *Larus leucopterus*, Aud. Orn. Biog., vol. iii. p. 553.

Adult, 26, 50.

During winter from New York to Nova Scotia. Not rare. Breeds on the islands and peninsulas of the Arctic Seas.

Adult Male.

Bill shorter than the head, strong, nearly straight, compressed. Upper mandible with the dorsal line nearly straight at the base, arched and declinate towards the end, the ridge convex, the sides slightly convex, the edges sharp, nearly direct, the tip rather obtuse. Nasal groove rather long and

narrow; nostrils in its fore part, lateral, longitudinal, linear, wider anteriorly, open and pervious. Lower mandible with a prominence at the end of the angle, which is long and narrow, the dorsal line then nearly straight and ascending, the sides flat and slightly inclined, the edges sharp and inflected.

Head rather large. Neck of moderate length. Body rather full. Wings very long. Feet of moderate length, rather slender; tibia bare below; tarsus somewhat compressed, covered before with numerous broad scutella, laterally and behind with roundish scales, on the outer side also with a row of small scutella; toes of moderate length, rather slender, all covered above with scutella; the anterior connected by reticulated webs, the two lateral with an external thick margin; the first extremely small, the third longest, the fourth longer than second; claw of hind toe smallest, of third largest, with an inner thin edge, of second next in size, all more or less compressed and obtuse.

The plumage in general is close, elastic, very soft and blended, on the back rather compact. Wings very long, broad, pointed; primaries tapering, the first longest, the second slightly shorter, the rest rapidly graduated; secondaries broad and rounded, the inner elongated and rather narrow. Tail of moderate length, even, of twelve broad feathers.

Bill gamboge-yellow, with a spot of orange-red near the end of lower mandible; the angle of the mouth and the edges of the eyelids are also orange-red. Iris pale yellow. Feet pale flesh-colour; claws greyish-brown. The whole plumage is pure white, excepting the back and upper surface of wings; the tips of the secondaries, the terminal third or so of the primaries, their shafts, and the upper tail-coverts also white.

Length to end of tail 26 inches, to end of wings 28¼; extent of wings 50; bill along the back 1⅜, along the edges 2½; tarsus 2½; middle toe 2 1/12, its claw 4/12; wing from flexure 17½; tail 6½.

Young in winter.

Bill yellow, the tips black. Edges of eyelids pale reddish-orange; iris brown. Feet yellowish flesh-colour; claws greyish-brown. The plumage is yellowish-grey, marked on the head and neck with longitudinal streaks of pale brown, on the back and wings with transverse undulations, those on the tail much fainter; the first six quills destitute of markings.

WESTERN GULL.

LARUS OCCIDENTALIS, *Aud.*

(NOT FIGURED.)

Two specimens of this Gull have been sent to me by Mr. TOWNSEND. One of them, an adult, is marked, "Male, Cape Disappointment, October 7th, 1836;" the other, a young bird, "Young Male, Cape Disappointment, October 6th, 1836." The iris of both is stated to have been light hazel. This species, which I presume to be undescribed, as I have not met with any account of it, is about equal to *Larus marinus* in size, and resembles *L. argentatus* in colour, but differs from both in many respects, as will be seen from the annexed description. It is especially remarkable for the great depth and comparative shortness of its bill, which in this respect approaches to *L. melanoleucus* of New South Wales. The adult specimen unfortunately has the wings imperfect, the primary quills having been only partially developed; but the wings of the younger bird are complete.

WESTERN GULL, *Larus occidentalis*, Aud. Orn. Biog., vol. v. p. 320.

Male, 27, wing 17¼, but the feathers not complete.

Adult Male.

Bill shorter than the head, robust, compressed. Upper mandible with the dorsal line straight as far as the end of the nostrils, decurved toward the end, the ridge convex, gradually narrowed to the point, the sides nearly flat, the edges sharp, inflected, toward the end direct and arcuato-declinate, the tip rather sharp; lower mandible with the angle long and narrow, the outline of the crura slightly arched, the dorsal line beyond the prominence at the angle ascending and slightly concave, the sides erect and nearly flat, the edges sharp, inflected, decurved toward the narrow tip. Nostrils medial, lateral, linear-oblong, wider anteriorly, in the fore part of the nasal groove, which is rather long and narrow.

Head large, broadly ovate, narrowed anteriorly. Neck of moderate length, thick. Feet of moderate length, rather slender; tibia bare for an inch and a quarter, reticulate; tarsus rather short, somewhat compressed, covered anteriorly with numerous scutella, laterally with angular scales, behind with

numerous small somewhat rectangular scales. Hind toe very small and elevated; the fore toes rather long, the fourth little shorter than the third; all scutellate above, and connected by reticulate webs; the lateral toes margined externally with a thick membrane. Claws small, slightly arched, somewhat compressed, blunt, that of the middle toe with the inner margin expanded.

The plumage is full, close, elastic, very soft and blended, on the back and wings rather compact. Wings very long, broad (four outer primaries only partially developed); secondaries broad and narrowly rounded. Tail even (not fully developed).

Bill yellow, with an orange-red patch toward the end of the lower mandible. "Iris light hazel." Feet flesh-coloured, claws dusky. The head, neck, lower parts, rump, and tail, are pure white; the back and wings light greyish-blue, of a deeper tint than in *L. argentatus;* the edges of the wing and the extremities of all the quills are white; the first seven quills are greyish-black toward the end, that colour including the outer webs and the greater part of the inner of the two first, and on the rest gradually diminishing, so as on the seventh merely to form a subterminal bar; the first quill with a patch of white on both webs near the end; the tips of all being white.

Length to end of tail 25 inches (but the tail is not full grown); bill along the ridge $2\frac{7}{12}$, along the edge of lower mandible $3\frac{1}{4}$, its depth at the base $\frac{11}{12}$, at the angle $\frac{11}{12}$; tarsus $2\frac{10}{12}$; hind toe $\frac{3\frac{1}{2}}{12}$, its claw $\frac{2\frac{1}{2}}{12}$; second toe $1\frac{9}{12}$, its claw ^{5}; third toe $2\frac{6}{12}$, its claw $\frac{5\frac{1}{2}}{12}$; fourth toe $2\frac{4\frac{1}{2}}{12}$, its claw $\frac{3}{12}$.

Young Male.

Bill flesh-coloured, beyond the nostrils and angle black, with the tips horn-coloured. Feet flesh-coloured; claws brownish-black. The upper part and sides of the head, the hind part and sides of the neck light brownish-grey, mottled and streaked with white; on the back the colour is light greyish-blue, some of the feathers mottled with brown, the adult plumage having been partially assumed; the wing-coverts are chiefly of a greyish-brown colour; the primary quills greyish-black, without white at the end; the secondary blackish-grey, margined and tipped with white, finely undulated with brown. The rump is white; the tail greyish-black, tipped with white; the whole outer web of the outer, and the basal half of that of the next feather white; the lower wing-coverts dusky-grey. All the lower parts are greyish-white, obscurely mottled with pale brownish-grey.

Length to end of tail 27 inches; bill along the ridge $2\frac{1}{2}$, along the edge of lower mandible $3\frac{2}{12}$, its height at the base $\frac{10}{12}$, at the angle $\frac{11}{12}$; wing from flexure $17\frac{1}{4}$; tail $7\frac{1}{4}$; tarsus $2\frac{11}{12}$; middle toe $2\frac{1}{2}$, its claw $\frac{7\frac{1}{2}}{12}$.

From the above description, it will be seen that in proportions and colouring this species does not differ much from *L. argentatus.* It is much larger, however; its bill is deeper and stronger in a very conspicuous degree, and its tarsi and toes are considerably longer.

Herring or Silvery Gull.

1 Adult in Spring. 2 Young in Autumn.

Drawn from Nature by J.J. Audubon F.R.S.F.L.S

Lith.d Printed & Col.d by J.T. Bowen Philad.a

THE HERRING OR SILVERY GULL.

LARUS ARGENTATUS, *Brunn.*

PLATE CCCCXLVIII.—MALE.

On the 22d of May, 1833, I was kindly received with my party on board the United States revenue cutter Swiftsure, commanded by Captain COOLEDGE, and on the morning of the next day was landed on White Head Island, at the entrance of the Bay of Fundy. This island is the property of a worthy Englishman of the name of FRANKLAND, who received us with great hospitality, gave us leave to ransack his dominions, and invited us to remain as long as we pleased. The Herring Gulls, he said, were breeding in great numbers, and we might expect good sport. We immediately set out in search of them, directing our course toward the pine woods, in which we were informed we should find them, and in approaching which we passed over an elevated marsh of great extent. As we came up to the place I observed that many of the Gulls had alighted on the fir-trees, while a vast number were sailing around, and when we advanced nearer, the former took to wing, abandoning their nests, and all flew about uttering incessant cries.

I was greatly surprised to see the nests placed on the branches, some near the top, others about the middle or on the lower parts of the trees, while at the same time there were many on the ground. It is true I had been informed of this by our captain, but I had almost believed that, on arriving at the spot, I should find the birds not to be Gulls. My doubts, however, were now dispelled, and I was delighted to see how strangely Nature had provided them with the means of securing their eggs and young from their arch-enemy man. My delight was greatly increased on being afterwards informed by Mr. FRANKLAND that the strange habit in question had been acquired by these Gulls within his recollection, for, said he, "when I first came here, many years ago, they all built their nests on the moss and in open ground; but as my sons and the fishermen collected most of their eggs for winter use, and sadly annoyed the poor things, the old ones gradually began to put their nests on the trees in the thickest parts of the woods. The youngest birds, however, still have some on the ground, and the whole are becoming less wild since I have forbidden strangers to rob their nests; for, gentlemen, you are the only persons out of my family that have fired a

gun on White Head Island for several years past, and I daresay you will not commit any greater havoc among them than is necessary, and to that you are welcome."

I was much pleased with the humanity of our host, and requested him to let me know when all the Gulls, or the greater part of them, would abandon the trees and resume their former mode of breeding on the ground, which he promised to do. But I afterwards found that this was not likely to happen, because on some other islands not far distant, to which the fishermen and eggers have free access, these Gulls breed altogether on the trees, even when their eggs and young are regularly removed every year, so that their original habits have been entirely given up. My opinion that, after being thus molested for some time longer, they may resort to the inaccessible shelves of the high rocks of these islands, was strengthened by Mr. FRANKLAND'S informing me that many pairs had already taken refuge in such places, where they bred in perfect security. The most remarkable effect produced by these changes of locality is, that the young which are hatched on the trees or high rocks, do not leave their nests until they are able to fly, while those on the ground run about in less than a week, and hide themselves at the sight of man among the moss and plants, which frequently saves them from being carried away. The young on the trees are shaken out of their nests, or knocked down with poles, their flesh being considered as very good by the fishermen and eggers, who collect and salt them for winter provision. Some of the nests which I saw were placed at a height of more than forty feet on the trees, others, seen in the thickest parts of the woods, were eight or ten feet from the ground, and were placed close to the main stem, so as to be with difficulty observed. It was truly curious to see the broad-winged birds make their way to and from them in these secluded retreats. The nests placed on the ground were several yards apart, and measured from fifteen to eighteen inches in diameter, their cavity being from four to six. The lower stratum consisted of grass, plants of various kinds, moss and grey lichens, and the whole was lined with fine bent, but without any feathers. Those on the trees measured from twenty-four to twenty-six inches in diameter externally, and were composed of the same materials, but in greater quantity, the object of which I thought might be to allow more space to the young while growing, as they could not enjoy the pleasure of running about like those hatched on the ground. Perhaps, however, the smaller size of the nests placed there may be owing to their belonging to the younger Gulls, as I have often observed that the older the individual the larger is its nest. Mr. FRANKLAND informed me that they frequently repair the old nests at the commencement of the breeding season, and I found the assertion proved by my own observation. The eggs, which are three, measure three inches

in length, by two in breadth, have an oval somewhat pyriform shape, are rough though not granulated, and are of a dull yellowish earthy colour, irregularly blotched and spotted with dark umber. They are nearly as large as those of the Great Black-backed Gull; but they differ considerably in size as well as in colour, some being more or less rounded or elongated. The yolk is bright orange, the albumen bluish-white; and they are excellent eating.

About the beginning of May the Herring Gulls collect into great flocks for the purpose of reproducing, and betake themselves to large sand-bars or mud-flats at low water, where their cacklings may be heard at a great distance. With the aid of a glass you may see them going through their courtships; the males swell their throats, walk about proudly, throw their heads upwards, and emit their love-notes. These general meetings take place at all hours of the day, according to the state of the tide, and continue for about a fortnight, when they all depart and betake themselves to the islands on which they breed. Several of these are situated near the one mentioned, and there is one near Cape Sable, a few miles from the most southern point of Nova Scotia, on which we saw thousands alighted on the trees as we were sailing along that coast on our way to Labrador. Some individuals begin to lay about the 19th of May or a few days earlier, while others have not finished the process until the middle of June. During this period they resort at certain hours to bare rocky islets, on which they copulate. At White Head Island, while we were seated on the edge of a beautiful sand-bar eating our dinner, we saw, on one of these rocks, a vast number, forming as it were a dense mass, which covered about half an acre. At twelve o'clock, we observed that all those which were not sitting on their eggs, flew over us and alighted on the sea, about half a mile from the shore, where they remained upwards of an hour, swimming gracefully but in silence all the while. A seal happening to raise its head above the water frightened them, and all raised their wings as if about to fly. Soon after they rose all at once, separated, and went off in search of food, but returned in less than an hour to the island, flying high and cackling loudly. A little before sunset all those unoccupied with incubation went off to the same rocky islands to roost, flying in silence, and mostly in files. It was curious to observe that, whenever a large flock made towards the sea cackling, all the Ducks about immediately flew off to a considerable distance, as if afraid of them; and we saw that these Gulls, although timorous in the presence of man, shew great courage in attacking predatory birds, such as Jays, Crows, Ravens, and even Hawks, which they pursued and forced into the deep woods, or drove away from the vicinity of their nests.

Shy and wary nearly in as great a degree as the Black-backed Gull, they

were with difficulty obtained, unless we approached them under cover. The least noise made them instantly leave their perch, and although there were six of us, each furnished with a good gun, and some sufficiently expert, not more than a dozen were killed that day, and all of them while flying. The moment one started, it would sound an alarm, on which hundreds would rise and sail over us, at such a height that it was useless to shoot at them. Now and then, one accidentally passing low over the woods, was brought down. While returning in the evening we shot one at a great height, having merely broken the tip of its wing. Having caught it, we placed it on the narrow path, on which it ran before us nearly to the house of the Governor, as Captain FRANKLAND is called. It offered no resistance, but bit severely, and now and then laid down to rest for a few moments. It ran fast enough to keep several yards before us, cackling all the while, and once suddenly made off from the path at a rapid rate.

Their flight is as strong as that of the Great Black-backed Gull, but more buoyant as well as graceful. During the love season their aërial evolutions are extremely beautiful; they pass through the air in wide circlings, at a great height, and then come down in curious zigzags until near the tops of the trees, or the surface of the sea. While in pursuit of fish, they dart in curved lines with great rapidity, frequently wheeling suddenly when over their prey, and falling towards it. When travelling, they pass indifferently over the land or the water, but generally at a considerable height. Their food consists principally of herrings, of which they destroy great numbers, following the shoals. They also feed on other fishes of small size, shrimps, crabs, and shell-fish, as well as on young birds and small quadrupeds, and suck all the eggs they can find. The rocky shores of the islands on which I found them breeding are covered with multitudes of sea-urchins, having short greenish spines, which gives them the semblance of a ball of moss. At low water the Herring Gulls frequently devour these animals, thrusting their bill through the shell, and sucking its contents. They also take up shells in the air, and drop them on the rocks to break them. We saw one that had met with a very hard mussel, take it up and drop it three times in succession, before it succeeded in breaking it, and I was much pleased to see the bird let it fall each succeeding time from a greater height than before. They seem to go out to sea in search of food at particular periods, setting out at the first ebb and returning to the shore as the tide rises.

The young are at first fed chiefly with shrimps and other small crustacea, which are picked up from the mud-bars or along the shores. They are then of a deep rusty colour all over, and when fully feathered they retain a good deal of that hue, but the feathers are edged with light grey or brown; the feet and legs are of a greenish-blue colour, including to purple; the bill dusky

or nearly black. In spring they acquire their full size, but still retain the grey and rusty plumage. The next year they shew much light ash-grey and white about the head, neck, and lower parts, the orange spot appears on the bill, the feet and legs are flesh-coloured, the tail still partially banded towards the extremity. At this age, however, I believe they breed, as I observed some coloured in the manner described, mated with older birds. The third spring they acquire the colouring represented in the plate.

I found no other species breeding on the same islands. Old and young associate together all the year round, excepting during the breeding season, when the latter separate and pursue their avocations together. The cry or cackling of this species, which is heard at a considerable distance, may be imitated by pronouncing the syllables *hac, hac, hac, cah, cah, cah.*

The Herring Gull has a greater range of migration along our coast and in the interior than any other American species. I have found it on our great lakes, and on the Ohio, Missouri and Mississippi, down to the Gulf of Mexico, during the autumnal months, and in winter along the shores of the latter, and all our eastern coasts. It may be said to be resident in the United States, as it breeds from off Boston to Eastport in Maine; but the greater number go farther north. We found the nests of some on the bare rocks of the Seal Islands off Labrador, but not on the coast itself. They were composed of dry plants and moss brought from the mainland. The birds kept by themselves, and appeared to be completely mastered by the Great Black-backed Gulls. On our return we saw old and young on the northern coast of Newfoundland, and on the different bays over which we passed.

I have represented an adult male, but not one of the largest, and a young bird shot in winter, which I have placed on a bunch of Racoon oysters, where it was standing when shot.

Larus argentatus, Bonap. Syn., p. 360.
Herring Gull, *Larus argentatus*, Nutt. Man., vol. ii. p. 304.
Herring Gull, *Larus argentatus*, Aud. Orn. Biog., vol. iii. p. 588; vol. v. p. 638.

Male, 23, 53. Young, in winter, 18¾, 51.

Abundant in autumn, winter, and early spring, from Texas along the whole Atlantic coast to Newfoundland. Breeds from the Bay of Fundy to Melville Island. Common in autumn on the Great Lakes, the Ohio, and Mississippi.

Adult Male in spring.

Bill shorter than the head, robust, compressed, higher near the end than at the base. Upper mandible with the dorsal line nearly straight at the base, declinate and arched towards the end, the ridge convex, the sides

slightly convex, the edges sharp, inflected, arcuato-declinate towards the end, the tip rather obtuse. Nasal groove rather long and narrow; nostril in its fore part, lateral, longitudinal, linear-oblong, wider, anteriorly pervious. Lower mandible with the angle long and narrow, the outline of the crura curved, the dorsal line beyond the prominence slightly concave, the sides erect and nearly flat, the edges sharp and inflected.

Head rather large, oblong, narrowed anteriorly. Neck of moderate length, strong. Body full. Feet of moderate length, rather slender; tibia bare below; tarsus somewhat compressed, covered anteriorly with numerous scutella, laterally with angular scales, behind with numerous small rectangular scales; hind toe very small and elevated, the fore toes of moderate length, rather slender, the fourth longer than the second, the third longest, all scutellate above, and connected by reticulated entire membranes, the lateral toes margined externally with a thick narrow membrane. Claws small, slightly arched, depressed, rounded, that of the middle toe with an expanded thin inner margin.

The plumage in general is close, full, elastic, very soft and blended, on the back rather compact. Wings very long, broad, acute, the first and second quills nearly equal, the rest of the primaries rather rapidly graduated; secondaries broad and rounded, the inner narrower. Tail of moderate length, even, of twelve rounded feathers.

Bill gamboge-yellow, with a large orange-red patch inclining to carmine towards the end of the lower mandible. Edges of eyelids gamboge; iris silvery white. Feet flesh-coloured; claws brownish-black. The head, neck, lower parts, rump and tail, are pure white; the back and wings pearl-grey or light bluish-grey, very slightly tinged with purple; the edges of the wing and the extremities of all the quills, are white. The first six quills are brownish-black towards the end, that colour including the outer webs and the greater part of the inner of the two first, and on the rest gradually diminishing, so as on the sixth merely to form a bar; first quill with a patch of white about an inch and a half long on both webs near the end; second with a circular white patch on the inner web, the tips of all white.

Length to end of tail 23 inches, to end of wings 24½, to end of claws 21½; extent of wings 53; wing from flexure 18; tail 7¼; bill along the ridge 2½, along the edge of lower mandible 3; its depth at the angle ¾; tarsus 2½; middle toe 2¼, its claws $\frac{4}{12}$. Weight 1 lb. 10 oz.

The Female is similar to the male, but somewhat less.

Young in November.

Bill brownish-black, paler at the base of the lower mandible. Edges of eyelids greenish-grey; iris hazel. Feet purplish flesh-colour; claws brownish-black. The general colour of the whole plumage is light purplish-grey,

the upper part of the head darker, the lower parts minutely mottled with pale yellowish-grey; the feathers of the upper parts, and the upper tail-coverts, irregularly edged and barred with greyish-white. Primary quills greyish-brown, their inner webs paler, their tips whitish; tail of the same colour, its base and outer webs of lateral feathers irregularly mottled with whitish, the tips brownish-white.

Length to end of tail 18¾ inches, to end of wings 20; extent of wings 51; wing from flexure 16; tail 6; bill along the ridge 2, along the edge of lower mandible 2½; tarsus 2¼; middle toe 2, its claw ⅓. Weight 22 oz.

From the examination of individuals of this species, it would appear that little reliance can be placed on the markings of the quills as affording a specific character. Four undoubted specimens of *Larus argentatus* now before me, have a white spot, varying in length from one to two inches, and including both webs, near the end of the *first* quill. One has no spot on the *second* quill; another has a spot on both webs of the *second* quill of one wing, and a smaller spot on part of the inner web of the same quill of the other wing; the third has a very small spot on part of the inner web of the same quill of both wings; the fourth has a large circular spot on the inner web of that quill also in both wings.

Male. The mouth is of the same structure as in *Larus marinus*, 1 inch 4 twelfths in width. The tongue is 1 inch 10½ twelfths long, and similar to that of the species just named. Lobes of the liver 3 inches, and 3¼ inches; gall-bladder 1 inch 4 twelfths long, 8 twelfths wide. Œsophagus 10½ inches long, at the commencement 2 inches wide, on the neck 1 inch 10 twelfths, and within the thorax 2 inches; it is thus very wide, and its walls are of moderate thickness, the muscular fibres distinct, and the inner coat longitudinally plicate. The stomach is proportionally small, of an elliptical form, 2 inches long, 1 inch 9 twelfths in breadth, its lateral muscles thin. It contains bones and scales of fishes. The epithelium in all respects as in *Larus marinus*. Cœca ½ inch long, 3 twelfths broad; cloaca globular, 1½ inches in diameter. Trachea 10 inches long, from 5 twelfths to 4 twelfths in breadth, moderately flattened, its rings 150, feeble. Bronchi wide, each of 28 half rings.

GLAUCOUS GULL OR BURGOMASTER.

LARUS GLAUCUS, *Brunn.*

PLATE CCCCXLIX.—ADULT MALE AND YOUNG.

I found this species on the coast of Labrador in very small numbers, all paired, in the month of July; but our endeavours to discover their nests were unavailing, and their shyness, which surpassed even that of the Great Black-backed Gull, prevented us from seeing much of their habits. I have never met with one on any part of our Atlantic coast, and I am much disposed to believe that those which may retire from the Arctic regions, where they are numerous, follow the north-west shores of America, as is indeed the case with many of the hyperborean birds, they giving an unaccountable preference to that side of the continent. It is true that I have often been told at Boston and New York that the Glaucous Gull had not unfrequently been procured there; but in no instance could I place any reliance upon the report, for when the supposed Glaucous Gull was shown to me, it proved to be merely a large specimen of the Herring Gull, *Larus argentatus*. Dr. RICHARDSON, who had good opportunities of observing this bird, speaks of it as follows:—

"This large and powerful Gull inhabits Greenland, the Polar Seas, Baffin's Bay, and the adjoining straits and coasts, in considerable numbers, during the summer. Its winter resorts in America have not been mentioned by authors; and the Prince of MUSIGNANO informs us, that it is exceedingly rare in the United States. It is notoriously greedy and voracious, preying not only on fish and small birds, but on carrion of every kind. One specimen killed on Captain Ross' expedition disgorged an auk when it was struck, and proved, on dissection, to have another in its stomach. Unless when impelled to exertion by hunger, it is rather a shy, inactive bird, and has little of the clamorousness of others of the genus. There is a considerable variety in the size of individuals. Captain SABINE found most of his specimens smaller than the *L. marinus*, but the largest individual of either species which he met with, was a male of *L. glaucus*, killed in Barrow's Strait. Its length was thirty-two inches; extent of wing sixty-five inches; weight four pounds and a quarter. Its tarsus was three inches and a half long, and its bill, which was prodigiously strong and arched, measured upwards of four

W.E.H.

Glaucous Gull Burgomaster.

Drawn from Nature by J.J.Audubon.F.R.S.F.L.S.

Adult male 2 Young first Autumn.

Lith.ª Printed & Col.ª by J. T. Bowen. Philad.ª

inches. The eggs of this Gull are pale purplish-grey, with scattered spots of umber-brown, and subdued lavender-purple."

My figures were taken from specimens kindly presented to me by my friend Captain JAMES CLARKE ROSS, R. N.

LARUS GLAUCUS, Bonap. Syn., p. 361.
LARUS GLAUCUS, *Burgomaster Gull*, Swains. and Rich. F. Bor. Amer., vol. ii. p. 416.
GLAUCOUS GULL or BURGOMASTER, Nutt. Man., vol. ii. p. 306.
GLAUCOUS GULL or BURGOMASTER, *Larus glaucus*, Aud. Orn. Biog., vol. v. p. 59.

Adult, 30; wing, 19½.

Met with in Labrador in summer. Baffin's Bay and Arctic Seas generally. Not observed within the limits of the United States.

Adult Male.

Bill shorter than the head, stout, compressed, higher near the end than at the base. Upper mandible with the dorsal line nearly straight for half its length, declinate and arched towards the end, the ridge convex, the sides very rapidly sloping and slightly convex, the edges sharp and somewhat inflected, the tip rather obtuse. Nasal groove rather long and narrow; nostrils in its fore part, lateral, longitudinal, linear-oblong, wider anteriorly, pervious. Lower mandible with the angle long and narrow, the outline of the crura decurved toward their junction, where there is a prominence, beyond which the outline ascends and is slightly concave, the sides erect and nearly flat, the edges sharp and a little inflected.

Head large, ovato-oblong, narrowed anteriorly. Neck of moderate length, strong. Body full. Feet of moderate length, rather slender; tibia bare for three-quarters of an inch; tarsus somewhat compressed, covered anteriorly with numerous much curved scutella, laterally with angular scales, behind with numerous small rectangular scales; hind toe very small and elevated, the fore toes of moderate length, slender, the fourth longer than the second, the third longest, all scutellate above, and connected by reticulated entire membranes, the lateral toes margined externally with a thick narrow membrane. Claws small, slightly arched, depressed, rounded, that of the middle toe with an expanded thin inner margin.

The plumage is very full, close, elastic, soft, and blended, on the back somewhat compact. Wings very long, rather broad, acute; the first quill scarcely two-twelfths of an inch shorter than the second, which is longest, the rest of the primaries rapidly graduated; secondaries broad and rounded. Tail of moderate length, nearly even, being slightly rounded, of twelve broad rounded feathers.

Bill gamboge-yellow, with a carmine patch towards the end of the lower

mandible, and the edges of both mandibles at the base of the same colour. Edges of eyelids red, iris yellow. Feet flesh-coloured, claws yellowish. The head, neck, lower parts, rump, and tail, are pure white; the back and wings light greyish-blue; the edges of the wing, and a large portion toward the end of all the quills, white.

Length to end of tail 30 inches; bill along the ridge $2\frac{9}{12}$, along the edge $3\frac{1}{2}$; wing from flexure $19\frac{1}{2}$; tail $8\frac{3}{4}$; tarsus $2\frac{11}{12}$; hind toe $\frac{9}{12}$, its claw $\frac{3}{12}$; second toe $\frac{10}{12}$, its claw $\frac{5}{12}$; middle toe $2\frac{7}{12}$, its claw $\frac{6}{12}$; outer toe $2\frac{1}{4}$, its claw $\frac{4}{12}$.

The Female, which is somewhat less, resembles the male.

Young in full plumage.

The bill is yellow to a little beyond the nostrils, black at the end; the feet flesh-coloured, the claws dusky. The iris brown. The general colour of the plumage is very pale yellowish-brown; the feathers of the back with a large dusky spot towards the end; the quills and tail-feathers barred with the same.

THE GREAT BLACK-BACKED GULL.

LARUS MARINUS, *Linn.*

PLATE CCCCL.—MALE.

High in the thin keen air, far above the rugged crags of the desolate shores of Labrador, proudly sails the tyrant Gull, floating along on almost motionless wing, like an Eagle in his calm and majestic flight. On widely extended pinions, he moves in large circles, constantly eyeing the objects below. Harsh and loud are his cries, and with no pleasant feeling do they come on the winged multitudes below. Now onward he sweeps, passes over each rocky bay, visits the little islands, and shoots off towards the mossy heaths, attracted perhaps by the notes of the Grouse or some other birds. As he flies over each estuary, lake or pool, the breeding birds prepare to defend their unfledged broods, or ensure their escape from the powerful beak of their remorseless spoiler. Even the shoals of the finny tribes sink deeper into the waters as he approaches; the young birds become silent in their

W.E.H.

Great Black backed Gull.

Male.

Drawn from Nature by J.J.Audubon,FRSFLS. Lith^d Printed & Col^d by J. T.Bowen, Phila^a.

nests or seek for safety in the clefts of the rocks; the Guillemots and Gannets dread to look up, and the other Gulls, unable to cope with the destroyer, give way as he advances. Far off among the roaring billows, he spies the carcass of some monster of the deep, and, on steady wing, glides off towards it. Alighting on the huge whale, he throws upwards his head, opens his bill, and, louder and fiercer than ever, sends his cries through the air. Leisurely he walks over the putrid mass, and now, assured that all is safe, he tears, tugs, and swallows piece after piece, until he is crammed to the throat, when he lays himself down surfeited and exhausted, to rest for awhile in the feeble sheen of the northern sun. Great, however, are the powers of his stomach, and ere long the half-putrid food which, vulture-like, he has devoured, is digested. Like all gluttons, he loves variety, and away he flies to some well-known isle, where thousands of young birds or eggs are to be found. There, without remorse, he breaks the shells, swallows their contents, and begins leisurely to devour the helpless young. Neither the cries of the parents, nor all their attempts to drive the plunderer away, can induce him to desist until he has again satisfied his ever-craving appetite. But although tyrannical, the Great Gull is a coward, and meanly does he sneak off when he sees the Skua fly up, which, smaller as it is, yet evinces a thoughtless intrepidity, that strikes the ravenous and merciless bird with terror.

If we compare this species with some other of its tribe, and mark its great size, its powerful flight, and its robust constitution, we cannot but wonder to find its range so limited during the breeding season. Few individuals are to be found northward of the entrance into Baffin's Bay, and rarely are they met with beyond this, as no mention is made of them by Dr. RICHARDSON in the Fauna Boreali-Americana. Along our coast, none breed farther south than the eastern extremity of Maine. The western shores of Labrador, along an extent of about three hundred miles, afford the stations to which this species resorts during spring and summer: there it is abundant, and there it was that I studied its habits.

The farthest limits of the winter migrations of the young, so far as I have observed, are the middle portions of the eastern coasts of the Floridas. While at St. Augustine, in the winter of 1831, I saw several pairs keeping company with the young Brown Pelican, more as a matter of interest than of friendship, as they frequently chased them as if to force them to disgorge a portion of their earnings, acting much in the same manner as the Lestris does toward the smaller Gulls, but without any effect. They were extremely shy, alighted only on the outer edges of the outer sand-bars, and could not be approached, as they regularly walked off before my party the moment any of us moved towards them, until reaching the last projecting point, they flew off, and never stopped while in sight. At what period they left that

coast I am unable to say. Some are seen scattered along our sea-shores, from the Floridas to the middle States, there being but few old birds among them; but the species does not become abundant until beyond the eastern extremities of the Connecticut and Long Island, when their number greatly increases the farther you proceed. On the whole of that extensive range, these birds are very shy and wary, and those which are procured are merely "chance shots." They seldom advance far up the bays, unless forced to do so by severe weather or heavy gales; and although I have seen this bird on our great lakes, I do not remember having ever observed an individual on any of our eastern rivers, at a distance from the sea, whereas the *Larus argentatus* is frequently found in such places.

Towards the commencement of summer, these wandering birds are seen abandoning the waters of the ocean to tarry for awhile on the wild shores of Labrador, dreary and desolate to man, but to them delightful as affording all that they can desire. One by one they arrive, the older individuals first. As they view from afar the land of their birth, that moment they emit their loud cries, with all the joy a traveller feels when approaching his loved home. The males sooner or later fall in with the females of their choice, and together they proceed to some secluded sand-bar, where they fill the air with their furious laughs until the rocks echo again. Should the student of nature happen to be a distant spectator of these meetings, he too must have much enjoyment. Each male bows, moves around his mate, and no doubt discloses to her the ardour of his love. Matters are managed to the satisfaction of all parties, yet day after day for awhile, at the retreat of the waters, they meet as if by mutual agreement. Now you see them dressing their plumage, now partially expanding their wings to the sun; some lay themselves comfortably down on the sand, while others, supported by one foot, stand side by side. The waters again advance, and the Gulls all move off in search of food. At length the time has arrived; small parties of a few pairs fly towards the desert isles. Some remain in the nearest to prepare their nests, the rest proceed, until each pair has found a suitable retreat, and before a fortnight has elapsed, incubation has commenced.

The nest of this species is usually placed on the bare rock of some low island, sometimes beneath a projecting shelf, sometimes in a wide fissure. In Labrador it is formed of moss and sea-weeds carefully arranged, and has a diameter of about two feet, being raised on the edges to the height of five or six inches, but seldom more than two inches thick in the centre, where feathers, dry grass, and other materials are added. The eggs are three, and in no instance have I found more. They are two inches and seven-eighths in length, by two inches and one-eighth in breadth, broadly ovate, rough but not granulated, of a pale earthy greenish-grey colour, irregularly blotched

and spotted with brownish-black, dark umber, and dull purple. Like those of most other Gulls, they afford good eating. This species lays from the middle of May to that of June, and raises only one brood in the season. The birds never leave their eggs for any length of time, until the young make their appearance. Both sexes incubate, the sitting bird being supplied with food by the other. During the first week, the young are fed by having their supplies disgorged into their bill, but when they have attained some size, the food is dropped beside or before them. When they are approached by man, they walk with considerable speed towards some hiding place, or to the nearest projecting ledge, beneath which they squat. When five or six weeks old, they take to the water, to ensure their escape, and swim with great buoyancy. If caught, they cry in the manner of their parents. On the 18th of June, several small ones were procured and placed on the deck of the Ripley, where they walked with ease and picked up the food thrown to them. As soon as one was about to swallow its portion, another would run up, seize it, tug at it, and if stronger, carry it off and devour it. On the 23d of that month, two individuals, several weeks old, and partly fledged, were also brought on board. Their notes, although feeble, perfectly resembled those of their parents. They ate greedily of everything that was offered to them. When fatigued they sat with their tarsi placed on the ground and extended forward, in the manner of all the Herons, which gave them a very ludicrous appearance. Ere a month had elapsed, they appeared to have formed a complete acquaintance with the cook and several of the sailors, had become quite fat, and conducted themselves much like Vultures, for if a dead Duck, or even a Gull of their own species, were thrown to them, they would tear it in pieces, drink the blood, and swallow the flesh in large morsels, each trying to rob the others of what they had torn from the carcass. They never drank water, but not unfrequently washed the blood and filth from their bills, by immersing them and then shaking the head violently. These birds were fed until they were nearly able to fly. Now and then, the sailors would throw them overboard while we were in harbour. This seemed to gratify the birds as well as the sailors, for they would swim about, wash themselves, and dress their plumage, after which they would make for the sides, and would be taken on board. During a violent gale, one night, while we were at anchor in the harbour of Bras d'Or, our bark rolled heavily, and one of our pets went over the side and swam to the shore, where, after considerable search next day, it was found shivering by the lee of a rock. On being brought to its brothers, it was pleasant to see their mutual congratulations, which were extremely animated. Before we left the coast, they would sometimes fly of their own accord into the water to bathe, but could not return to the deck without assistance, although they

endeavoured to do so. I had become much attached to them, and now and then thought they looked highly interesting, as they lay panting on their sides on the deck, although the thermometer did not rise above 55°. Their enmity to my son's pointer was quite remarkable, and as that animal was of a gentle and kindly disposition, they would tease him, bite him, and drive him fairly from the deck into the cabin. A few days after leaving St. George's Bay in Newfoundland, we were assailed by a violent gale, and obliged to lie-to. Next day one of the Gulls was washed overboard. It tried to reach the vessel again, but in vain; the gale continued; the sailors told me the bird was swimming towards the shore, which was not so far off as we could have wished, and which it probably reached in safety. The other was given to my friend Lieutenant GREEN of the United States army, at Eastport in Maine. In one of his letters to me the following winter, he said that the young *Larus marinus* was quite a pet in the garrison, and doing very well, but that no perceptible change had taken place in its plumage.

On referring to my journal again, I find that while we were at anchor at the head of St. George's Bay, the sailors caught many codlings, of which each of our young Gulls swallowed daily two, measuring from eight to ten inches in length. It was curious to see them after such a meal: the form of the fish could be traced along the neck, which for awhile they were obliged to keep stretched out; they gaped and were evidently suffering; yet they would not throw up the fish. About the time the young of this species are nearly able to fly, they are killed in considerable numbers on their breeding-grounds, skinned and salted for the settlers and resident fishermen of Labrador and Newfoundland, at which latter place I saw piles of them. When they are able to shift for themselves, their parents completely abandon them, and old and young go separately in search of food.

The flight of the Great Black-backed Gull is firm, steady, at times elegant, rather swift, and long protracted. While travelling, it usually flies at the height of fifty or sixty yards, and proceeds in a direct course, with easy, regulated flappings. Should the weather prove tempestuous, this Gull, like most others, skims over the surface of the waters or the land within a few yards or even feet, meeting the gale, but not yielding to it, and forcing its way against the strongest wind. In calm weather and sunshine, at all seasons of the year, it is fond of soaring to a great height, where it flies about leisurely and with considerable elegance for half an hour or so, in the manner of Eagles, Vultures, and Ravens. Now and then, while pursuing a bird of its own species, or trying to escape from an enemy, it passes through the air with rapid boundings, which, however, do not continue long, and as soon as they are over it rises and slowly sails in circles. When man encroaches

on its domains, it keeps over him at a safe distance, not sailing so much as moving to either side with continued flappings. To secure the fishes on which it more usually preys, it sweeps downwards with velocity, and as it glides over the spot, picks up its prey with its bill. If the fish be small, the Gull swallows it on wing, but if large, it either alights on the water, or flies to the nearest shore to devour it.

Although a comparatively silent bird for three-fourths of the year, the Great Black-backed Gull becomes very noisy at the approach of the breeding season, and continues so until the young are well fledged, after which it resumes its silence. Its common notes, when it is interrupted or surprised, sound like *cack, cack, cack.* While courting, they are softer and more lengthened, and resemble the syllables *cawah*, which are often repeated as it sails in circles or otherwise, within view of its mate or its place of abode.

This species walks well, moving firmly and with an air of importance. On the water it swims lightly but slowly, and may soon be overtaken by a boat. It has no power of diving, although at times, when searching for food along the shores, it will enter the water on seeing a crab or a lobster, to seize it, in which it at times succeeds. I saw one at Labrador plunge after a large crab in about two feet of water, when, after a tug, it hauled it ashore, where it devoured it in my sight. I watched its movements with a glass, and could easily observe how it tore the crab to pieces, swallowed its body, leaving the shell and the claws, after which it flew off to its young and disgorged before them.

It is extremely voracious, and devours all sorts of food excepting vegetables, even the most putrid carrion, but prefers fresh fish, young birds, or small quadrupeds, whenever they can be procured. It sucks the eggs of every bird it can find, thus destroying great numbers of them, as well as the parents, if weak or helpless. I have frequently seen these Gulls attack a flock of young Ducks while swimming beside their mother, when the latter, if small, would have to take to wing, and the former would all dive, but were often caught on rising to the surface, unless they happened to be among rushes. The Eider Duck is the only one of the tribe that risks her life, on such occasions, to save that of her young. She will frequently rise from the water, as her brood disappear beneath, and keep the Gull at bay, or harass it until her little ones are safe under some shelving rocks, when she flies off in another direction, leaving the enemy to digest his disappointment. But while the poor Duck is sitting on her eggs in any open situation, the marauder assails her, and forces her off, when he sucks the eggs in her very sight. Young Grouse are also the prey of this Gull, which chases them over the moss-covered rocks, and devours them before their parents. It follows the shoals of fishes for hours at a time, and usually with great success.

On the coast of Labrador, I frequently saw these birds seize flounders on the edges of the shallows; they often attempted to swallow them whole, but, finding this impracticable, removed to some rock, beat them, and tore them to pieces. They appear to digest feathers, bones, and other hard substances with ease, seldom disgorging their food, unless for the purpose of feeding their young or mates, or when wounded and approached by man, or when pursued by some bird of greater power. While at Boston in Massachusetts, one cold winter morning, I saw one of these Gulls take up an eel, about fifteen or eighteen inches in length, from a mud bank. The Gull rose with difficulty, and after some trouble managed to gulp the head of the fish, and flew towards the shore with it, when a White-headed Eagle made its appearance, and soon overtook the Gull, which reluctantly gave up the eel, on which the Eagle glided towards it, and, seizing it with its talons, before it reached the water, carried it off.

This Gull is excessively shy and vigilant, so that even at Labrador we found it difficult to procure it, nor did we succeed in obtaining more than about a dozen old birds, and that only by stratagem. They watched our movements with so much care as never to fly past a rock behind which one of the party might be likely to lie concealed. None were shot near the nests when they were sitting on their eggs, and only one female attempted to rescue her young, and was shot as she accidentally flew within distance. The time to surprise them was during violent gales, for then they flew close to the tops of the highest rocks, where we took care to conceal ourselves for the purpose. When we approached the rocky islets on which they bred, they left the place as soon as they became aware of our intentions, cackled and barked loudly, and when we returned, followed us at a distance more than a mile.

They begin to moult early in July. In the beginning of August the young were seen searching for food by themselves, and even far apart. By the 12th of that month they had all left Labrador. We saw them afterwards along the coast of Newfoundland, and while crossing the Gulf of St. Lawrence, and found them over the bays of Nova Scotia, as we proceeded southward. When old, their flesh is tough and unfit for food. Their feathers are elastic, and good for pillows and such purposes, but can rarely be procured in sufficient quantity.

The most remarkable circumstance relative to these birds is, that they either associate with another species, giving rise to a hybrid brood, or that when very old they lose the dark colour of the back, which is then of the same tint as that of the *Larus argentatus*, or even lighter. This curious fact was also remarked by the young gentlemen who accompanied me to Labrador; and although it is impossible for me to clear up the doubts that

may be naturally entertained on this subject, whichever of the two suppositions is adopted, the fact may yet be established and accounted for by persons who may have better opportunities of watching them and studying their habits. No individuals of *Larus argentatus* were, to my knowledge, seen on that coast during the three months which I passed there, and the fishermen told us that the "saddle-backs were the only large Gulls that ever breed there."

This bird must be of extraordinary longevity, as I have seen one that was kept in a state of captivity more than thirty years. The following very interesting account of the habits of a partially domesticated individual I owe to my esteemed and learned friend Dr. NEILL of Edinburgh.

"In the course of the summer of 1818, a 'big scorie' was brought to me by a Newhaven fisher-boy, who mentioned that it had been picked up at sea, about the mouth of the Frith of Forth. The bird was not then fully fledged: it was quite uninjured: it quickly learned to feed on potatoes and kitchen refuse, along with some Ducks; and it soon became more familiar than they, often peeping in at the kitchen window in hopes of getting a bit of fat meat, which it relished highly. It used to follow my servant PEGGY OLIVER about the doors, expanding its wings and vociferating for food. After two moults I was agreeably surprised to find it assuming the dark plumage of the back, and the shape and colour of the bill of the *Larus marinus*, or Great Black-backed Gull; for I had hitherto regarded it as merely a large specimen of the Lesser Black-backed (*L. fuscus*), a pair of which I then possessed, but which had never allowed the new comer to associate with them. The bird being perfectly tame, we did not take the precaution of keeping the quills of one wing cut short, so as to prevent flight; indeed, as it was often praised as a remarkably large and noble looking Sea-maw, we did not like to disfigure it. In the winter of 1821–2, it got a companion in a cock-heron, which had been wounded in Coldinghame Muir, brought to Edinburgh alive, and kept for some weeks in a cellar in the old college, and then presented to me by the late Mr. JOHN WILSON, the janitor,—a person remarkably distinguished for his attachment to natural history pursuits. This Heron we succeeded in taming completely, and it still (1835) remains with me, having the whole garden to range in, the trees to roost upon, and access to the loch at pleasure, the loch being the boundary of my garden. Some time in the spring of 1822, the large Gull was missing; and we ascertained (in some way that has now escaped my memory) that it had not been stolen, nor killed, as we at first supposed, but had taken flight, passing northwards over the village, and had probably therefore gone to sea. Of course I gave up all expectation of ever hearing more of it. It was not without surprise, therefore, that on going home one day in the end of October of that year, I

heard my servant calling out with great exultation, 'Sir, Big Gull is come back!' I accordingly found him walking about in his old haunts in the garden, in company with, and recognising (as I am firmly persuaded) his old friend the Heron. He disappeared in the evening, and returned in the morning, for several days; when PEGGY OLIVER thought it best to secure him. He evidently did not like confinement, and it was concerted that he should be allowed his liberty, although he ran much risk of being shot on the mill-pond by youthful sportsmen from Edinburgh. After this temporary captivity, he was more cautious and shy than formerly; but still he made almost daily visits to the garden, and picked up herrings or other food laid down for him. In the beginning of March 1823 his visits ceased; and we saw no more of him till late in the autumn of that year. These winter visits to Canonmills, and summer excursions to the unknown breeding-place, were continued for years with great uniformity: only I remarked that after the Gull lost his protectress, who died in 1826,* he became more distant in his manners. In my note-book, under date of 26th October, 1829, I find this entry: 'Old PEGGY'S Great Black-backed Gull arrived at the pond this morning, the seventh (or eighth) winter he has regularly returned. He had a scorie with him, which was soon shot on the loch, by some cockney sportsman.' The young bird, doubtless one of his offspring, had its wing shattered, and continued alive in the middle of the pond, occasionally screaming piteously, for two or three days, till relieved by death. The old Gull immediately abandoned the place for that winter, as if reproaching us for cruelty. By next autumn, however, he seemed to have forgotten the injury; for, according to my record, '30th October, 1830. The Great Black-backed Gull once more arrived at Canonmills garden.' The periods of arrival, residence, and departure were nearly similar in the following year. But in 1832, not only October, but the months of November and December passed away without Gull's making his appearance, and I of course despaired of again seeing him. He did, however, at length arrive. The following is the entry in my common-place book: 'Sunday, 6th January, 1833. This day the Great Black-back returned to the mill-pond, for (I think) the eleventh season. He used to re-appear in October in former years, and I concluded him dead or shot. He recognised my voice, and hovered over my head.' He disappeared early in March as usual, and reappeared at

* "PEGGY OLIVER was remarkable for the zeal and taste she displayed in the domesticating of uncommon animals, as well as in the culture of plants: her expertness in the latter department is noticed and praised by Mr. LOUDON in his Gardener's Magazine. Her funeral was attended by some of the most distinguished naturalists here, and, among others, by your friend Dr. MACCULLOCH of Pictou, who happened to be in Edinburgh at the time, and whose friendship I have also the happiness to enjoy."

Canonmills on 23d December, 1833, being a fortnight earlier than the date of his arrival in the preceding season, but six weeks later than the original period of reappearance. He left in the beginning of March as usual, and I find from my notes that he 'reappeared on 30th December, 1834, for the season, first hovering around and then alighting on the pond as in former years.' The latest entry is, '11th March, 1835. The Black-backed Gull was here yesterday, but has not been seen to-day; nor do I expect to see him till November.'

"This Gull has often attracted the attention of persons passing the village of Canonmills, by reason of its sweeping along so low or near the ground, and on account of the wide expanse of wing which it thus displays. It is well known to the boys of the village as 'NEILL'S Gull,' and has, I am aware, owed its safety more than once to their interference, in informing passing sportsmen of its history. When it first arrives in autumn, it is in the regular habit of making many circular sweeps around the pond and garden, at a considerable elevation, as if reconnoitring; it then gradually lowers its flight, and gently alights about the centre of the pond. Upon the gardener's mounting the garden-wall with a fish in his hand, the Gull moves towards the overhanging spray of some large willow-trees, so as to catch what may be thrown to him, before it sinks in the water. There can be no doubt whatever of the identity of the bird. Indeed, he unequivocally shows that he recognises my voice when I call aloud 'Gull, Gull,' for whether he be on wing or afloat, he immediately approaches me.

"A few pairs of the Great Black-backed Gull breed at the Bass Rock yearly, and it seems highly probable that my specimen had originally been hatched there. If I may be allowed a conjecture, I would suppose that, after attaining maturity, he for some years resorted to the same spot for the purpose of breeding; but that of late years, having lost his mate or encountered some other disaster, he has extended his migration for that purpose to some very distant locality, which has rendered his return to winter quarters six weeks later than formerly."

LARUS MARINUS, Linn. Syst. Nat., vol. i. p. 225.

BLACK-BACKED GULL or COBB, Nutt. Man., vol. ii. p. 308.

GREAT BLACK-BACKED GULL, *Larus marinus*, Aud. Orn. Biog., vol. iii. p. 305; vol. v. p. 636.

Male, 29½, 67.

Not uncommon during winter as far south as Florida, the young especially. Common from New York to Labrador, where it breeds. Lake Erie, Ontario, the St. Lawrence, Ohio, and Mississippi rivers. Columbia river.

Adult Male in summer.

Bill shorter than the head, robust, compressed, higher near the end than at the base. Upper mandible with the dorsal line nearly straight at the base, declinate and arched towards the end, the ridge convex, the sides slightly convex, the edges sharp, inflected, arcuate-declinate towards the end, the tip rather obtuse. Nasal groove rather long and narrow ; nostril in its fore part, lateral, longitudinal, linear, wider anteriorly, pervious. Lower mandible with the angle long and narrow, the outline of the crura rather concave, as is that of the remaining part of the mandible, a prominent angle being formed at their meeting, the sides nearly flat, the edges sharp and inflected.

Head rather large, oblong, narrowed anteriorly. Neck of moderate length, strong. Body full. Wings long. Feet of moderate length, rather slender ; tibia bare below ; tarsus somewhat compressed, covered anteriorly with numerous scutella, laterally with angular scales, behind with numerous small oblong scales, hind toe very small and elevated, the fore toes of moderate length, rather slender, the fourth longer than the second, the third longest, all scutellate above, and connected by reticulated entire membranes, the lateral toes margined externally with a narrow membrane. Claws small, slightly arched, depressed, rounded, that of middle toe with an expanded inner margin.

The plumage in general is close, full, elastic, very soft and blended, on the back rather compact. Wings very long, broad, acute, the first quill longest, the second scarcely shorter; the rest of the primaries rather rapidly graduated ; secondaries broad and rounded, the inner narrower. Tail of moderate length, even, of twelve rounded feathers.

Bill gamboge-yellow, the lower mandible bright carmine towards the end. Edges of eyelids bright carmine, iris silvery. Feet yellow, claws black. The head, neck, and all the lower parts, pure white ; back and wings deep blackish-grey tinged with purple, or dark slate-colour ; the rump and tail white, as are the edges of the wing, and a large portion of the extremities of all the quills ; the second, third, fourth, and fifth primaries have a broad band of black across their ends, the inner web only of the second being so marked, in some specimens however both webs. The œsophagus is very large, the gizzard small, the intestine four feet long, and about the thickness of a goose quill.

Length to end of tail 29¾ inches, to end of wings 31½, to end of claws 29¼ ; extent of wings 67 ; wing from flexure 20 ; tail 9 ; bill along the ridge 2 $\frac{9}{12}$, along the edge of lower manible 3 $\frac{9}{12}$; its depth at the angle 1, at the base $\frac{11}{12}$; tarsus 3 $\frac{2}{12}$; middle toe 2½, its claw ½. Weight 3 lbs.

The Female is similar to the male, but considerably less.

The Young, when fledged, have the bill brownish-black, the iris dark

brown, the feet as in the adult. The head and neck are greyish-white, streaked with pale brownish grey; the upper parts mottled with brownish-black, brownish-grey, and dull white, the rump paler. The primary quills blackish-brown, slightly tipped with brownish-white; the tail-feathers white, with a large brownish-black patch towards the end, larger on the middle feathers, which are also barred towards the base with dusky. The lower parts are greyish-white, the sides and lower tail-coverts obscurely mottled with greyish-brown.

Male, from Dr. T. M. Brewer. The mouth is of moderate width, its breadth being 1 inch 9 twelfths; the palate flat, with two very prominent papillate ridges, and four series of intervening papillæ; on the upper mandible beneath are five ridges, and the horny edges are prominent and thin, but very strong; the posterior aperture of the nares linear, 1 inch 9 twelfths long. The tongue is 2 inches 2 twelfths in length, fleshy above, horny beneath, rather narrow, deeply channelled, the base emarginate and finely papillate, the tip narrowly rounded.

The left lobe of the liver is larger than the right, which, however, is more elongated, being 4 inches in length, the other 3 inches; the gall-bladder oblong, 1 inch 2 twelfths by 7 twelfths. There is a larger accumulation of fat under the parietes of the abdomen, and appended to the stomach.

The œsophagus is 14 inches long; at the commencement its width is 2½ inches, it then contracts to 1 inch 9 twelfths, at the lower part of the neck enlarges to 2 inches, and towards the proventriculus to 2½ inches; it then suddenly contracts at the commencement of the stomach. This organ is rather small, and of an oblong form, 2½ inches long, 1 inch 9 twelfths broad; the lateral muscles of moderate size, the inferior prominent, the tendons large and radiated; the epithelium extremely dense, thick, with strong longitudinal ridges, and of a bright red colour. It contains remains of crabs. The proventricular glands, which are very small, being 1½ twelfths in length, and ¼ twelfth broad, form a belt 1¼ inches in breadth, traversed by very prominent rugæ, continuous with those of the stomach. The inner membrane of the œsophagus is strongly plaited, and that part is capable of being distended to 3 inches. The intestine is 50 inches long, its greatest width 4½ twelfths; the cœca ½ inch long, ¼ inch wide, their distance from the extremity 5 inches, the rectum is 8 twelfths in width, and the cloaca forms a globular dilatation 1½ inches in diameter.

The trachea is 12 inches long; at the top 7½ twelfths wide, gradually contracting to 4½ twelfths, considerably flattened, its rings slightly ossified, 148 in number, of moderate breadth, very thin, contracted in the middle line before and behind; the last half ring is large, moderately arched. In this, as in all the other Gulls, there is a pair of slender muscles arising from the

sides of the thyroid bone in front, separating from the trachea, attaching themselves to the subcutaneous cellular tissue, and inserted into the furcula. Another pair arise from the same bone in front, spreading over the whole anterior surface of the trachea, then become collected on the sides, send off a slip to the costal process of the sternum, and continue narrow, to be inserted into the last arched half-ring of the trachea; thus forming what is called a single pair of inferior laryngeal muscles. Bronchi wide, each with 28 half rings.

FAMILY XLIII.—PROCELLARINÆ. FULMARS.

Bill generally shorter than the head, moderately stout, compressed; upper mandible with the ridge formed of two generally united plates, at the anterior part of which, usually about half the length of the bill, are the nostrils; the sides separated by a groove, the tip a decurved, compressed, pointed unguis; lower mandible with the angle very long and narrow, the tip more or less decurved. Head of moderate size, ovate; neck of moderate length; body compact. Feet of ordinary length, rather slender; tibia bare below for a short space; tarsus a little compressed, anteriorly scutellate; toes four, the first extremely small and elevated, with a conical deflected claw; anterior toes webbed; the third and fourth nearly equal. Claws arched, compressed, acute. Plumage full, soft, rather compact above. Wings long, rather broad, pointed, the first quill generally longest. Tail short, of from twelve to sixteen feathers. Œsophagus very wide, often enormously dilated, especially at its lower part, stomach small, moderately muscular; intestine of moderate length; cœca rather long; cloaca oblong or globular. Trachea simple, with a single pair of inferior laryngeal muscles.

Genus I.—LESTRIS, *Illiger*. JAGER.

Bill shorter than the head, strong, slightly compressed, straight, with the tip curved; upper mandible with the dorsal line nearly straight, toward the tip decurved, the ridge broad and convex, formed by two plates, which overlap the nostrils, the sides narrow and convex, the edges sharp and inflected, the tip or unguis decurved, compressed, acute; nasal groove long, narrow; the nostrils in its fore part medial, lateral, longitudinal, broad before, extremely narrow behind, open and pervious; lower mandible with the angle long and narrow, a slight prominence at its extremity, beyond which the dorsal line is slightly concave, the sides erect, and slightly convex, the edges sharp and inflected, the tip obliquely truncate. Head rather large; neck of moderate length; body rather full. Feet of moderate length, rather stout; tibia bare at its lower part, and rough all round, with small convex scales; tarsus compressed behind and scabrous, anteriorly scutellate; hind toe extremely small and elevated; fore toes of moderate size, connected by convex webs, the third toe longest, the fourth little shorter. Claws strong, much curved, very acute, compressed. Plumage full, soft, blended, on the back rather compact. Wings very long, rather broad, pointed, the first quill longest. Tail of moderate length, or elongated, of twelve feathers, of which the middle are longest. Tongue broadly channelled above, contracted and induplicate toward the end, with the point slit; œsophagus very wide; stomach small, moderately muscular, with the epithelium thin, dense, and longitudinally rugous; intestine rather short and wide; cœca rather long; cloaca oblong.

THE POMARINE JAGER.

LESTRIS POMARINUS, *Temm.*

PLATE CCCCLI.—FEMALE.

This bird I never had an opportunity of examining until I visited Labrador; nor am I able to give you much information respecting its habits as obtained by my own observation, and therefore I shall take the liberty of adding to my description such notices as I may judge interesting, taken from the works of authors who, having seen for themselves, are entitled to credit.

While sailing towards the harbour of Little Macatina, and yet about forty miles distant from it, although not far from the shore, we observed a bird of this species approaching the vessel. It flew in the manner of the Pigeon Hawk, to my account of which I may refer you, alighted on the water like a Gull, and fed on some codfish's liver that had been thrown overboard for the purpose of attracting it. Several small Petrels joined it, but it did not come within shot, and the sea was too rough for even our whale-boat. On the 30th of July the young men of my party brought me a fine adult female, in excellent order, from which I drew the figure in the plate. A few days after we experienced a very heavy gale while in the harbour of Bras d'Or, during the continuance of which twenty or thirty of these birds came about us, although none of them approached within shot, and no boat could have ridden the furious waves without imminent danger. On that occasion, however, I was enabled to observe some of their habits. They flew wildly about, yet with much grace, moving rapidly to and fro, now struggling against the blast, now bearing off and drifting to a considerable distance. Many Gulls were flying about, having also made for the harbour to obtain some shelter from the storm. The Lestris chased the smaller species with effect, but never approached the Great Black-backed Gulls, nor even their young, which were also flying with the rest. The Kitiwakes and the Ring-billed Gulls were the species which we saw them attack, although they did not procure much food from them, the weather being such that they could not fish. They were therefore contented, as was the Lestris, with the fishes that had been thrown on shore. At times the Jagers would ramble over the land, flying close upon the rocks, and proceeding at a rapid rate even against the wind. They remained in our neighbourhood until the tempest

Pomerine Jager.

Adult Female.

Drawn from Nature by J.J. Audubon, F.R.S.F.L.S.

Lith.ª Printed & Col.ª by J. T. Bowen, Philad.ª

abated, when they went off to sea, and I saw no more of them until we reached St. George's Bay in Newfoundland.

There, on a squally afternoon, two or three of them were observed flying around, but keeping at such a distance that we could not shoot any of them. The following day, after setting sail, we encountered a heavy gale, which, although foretold by me from the appearance of the birds in the harbour, our good captain would not believe as likely to happen. We were obliged to lie-to, and were tossed about for three nights and days, but escaped with little other damage than the loss of a pet Gull, which was washed overboard.

On our return to Eastport, Captain EMERY told me that he had seen a great number of these Jagers near Cape Sable; and at Halifax, in Nova Scotia, I was assured that they breed on Sable Island, which is sixty or seventy miles distant from the coast. I never observed one of these birds along the shores of the United States, although some of the genus go as far south in winter as the Gulf of Mexico.

Nothing is known with certainty respecting the changes which this species undergoes as it advances toward maturity. Captain JAMES CLARK ROSS, R. N., has informed me that a nest containing two eggs was found by him near Fury Point, close by the edge of a small lake. I have no doubt that this bird breeds in Labrador, as the female which I obtained in July appeared as if it had young at the time.

My friend Mr. SELBY states that he is not aware that an adult bird has yet been killed in Britain. M. TEMMINCK says it forms a rude nest of grass and moss, which is placed on a tuft in the marshes, or on a rock, and lays two or three very pointed eggs, of a greyish-olive colour, marked with a few blackish spots. Dr. RICHARDSON has the following notice respecting it in the Fauna Boreali-Americana :—"The Pomarine Jager or Gull-hunter is not uncommon in the Arctic seas and northern outlets of Hudson's Bay, where it subsists on putrid fish and other animal substances thrown up by the sea, and also on the matters which the Gulls disgorge when pursued by it. It retires from the north in the winter, and makes its first appearance at Hudson's Bay in May, coming in from seaward."

LESTRIS POMARINA, Bonap. Syn., p. 364.

LESTRIS POMARINA, *Pomarine Jager*, Swains. and Rich. F. Bor. Amer., vol. ii. p. 429.

POMARINE JAGER, Nutt. Man., vol. ii. p. 315.

POMARINE JAGER, *Lestris pomarinus*, Aud. Orn. Biog., vol. iii. p. 396; vol. v p. 643.

Female, 20¼, 48.

From Massachusetts northward. Seen in Labrador. Breeds in high northern latitudes.

Adult Female.

Bill shorter than the head, strong, slightly compressed, straight, the tip curved. Upper mandible with the dorsal line nearly straight, toward the tip curved, the ridge broad and convex with a slight central depression, the sides convex, the edges sharp and inflected, the tip compressed, rather rounded but sharp. Nasal groove long, narrow, curved; nostrils in its fore part, medial, lateral, longitudinal, broad before, extremely narrow behind, open and pervious. Lower mandible with the angle long and narrow, a slight prominence at its extremity, beyond which the dorsal line is slightly concave, the sides erect, and slightly convex, the edges sharp and inflected, the tip obliquely truncate.

Head rather large. Neck of moderate length. Body rather full. Feet of moderate length, rather slender; tibia bare at its lower part, and rough all round with small convex scales; tarsus compressed behind, anteriorly covered with decurved scutella, the sides reticulated, the hind part rough with small pointed scales; hind toe extremely small and elevated, the fore toes of moderate size, connected by reticulated webs, which have their margins convex; the third toe longest, the fourth nearly as long, all scutellate above. Claws strong, curved, very acute, compressed, that of third toe with a sharp inner edge.

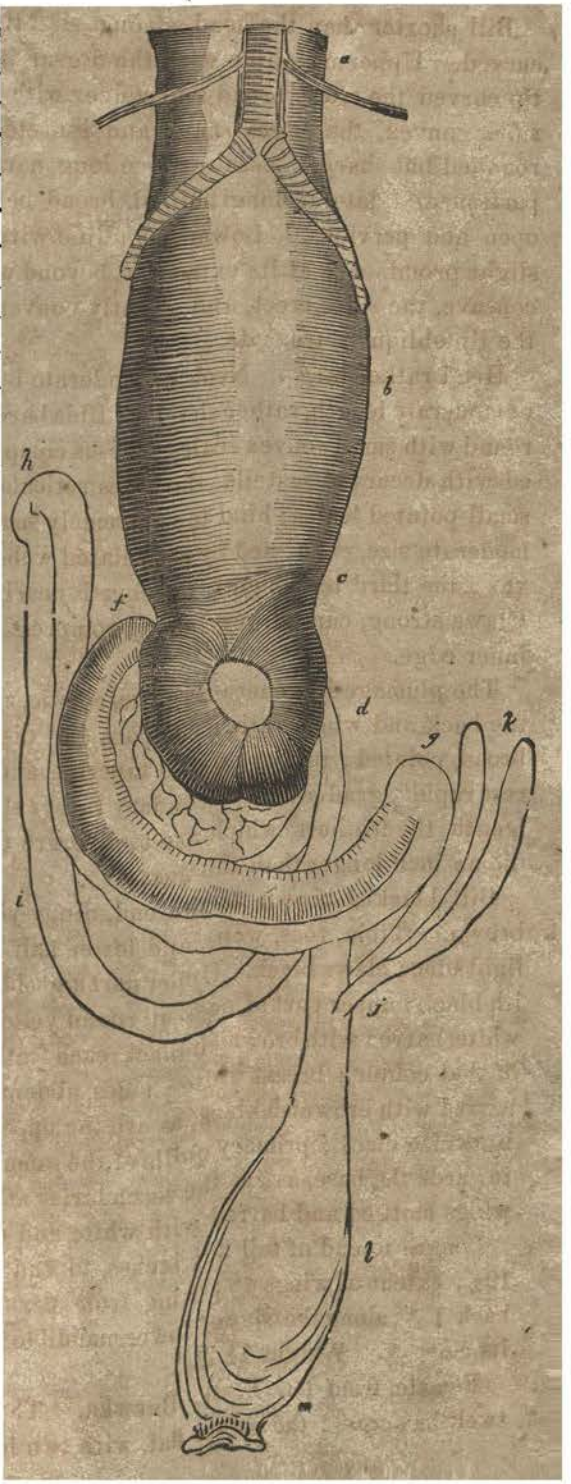
The plumage in general is close, elastic, soft and blended; the feathers on the back and wings rather compact and distinct. Wings very long, rather broad, pointed; primary quills tapering and rounded, the first longest, the rest rapidly graduated; secondary rather short, rounded. Tail of moderate length, the feathers, which are twelve, are broad and rounded, the two middle an inch longer than the next.

Bill blackish-brown at the end, dingy-yellow towards the base. Iris brown. Tibia, toes, webs, and lower half of tarsus black, the upper half light blue; claws black. Upper part and sides of the head anteriorly brownish-black; upper part of neck all round yellowish-white; the rest of the neck white, barred with brownish-black, each feather having two transverse bands of that colour; breast white; sides, abdomen and lower tail-coverts white, barred with brownish-black, as are the upper tail-coverts. Back and wings brownish-black; primary quills of the same colour, white on the inner webs towards the base, as are the secondaries and tail-feathers, lower surface of wings mottled and barred with white and dusky.

Length to end of tail 20¼ inches, to end of wings 20¼, to end of claws 19¼; extent of wings 48; wing from flexure 14; tail $6\frac{3}{12}$; bill along the back $1\frac{9}{12}$, along the edge of lower mandible $2\frac{1}{2}$; tarsus $2\frac{1}{12}$; middle toe $1\frac{9}{12}$, its claw $\frac{8}{12}$. Weight 1½ lbs.

Female, from Dr. T. M. Brewer. The mouth rather wide, 1 inch 2 twelfths across; the palate flat, with two longitudinal papillate ridges, the

space between which and the palatal slit is also covered with papillæ; anteriorly, on the mandible, are three ridges; posterior aperture of the nares oblongo-linear, with its margins papillate; the lower mandible dilatable, as in the Gulls. Tongue 1 inch long, emarginate and papillate at the base, broadly channelled above, contracted and induplicate toward the end, horny beneath, and thin-edged, with the point slit to the depth of 1½ twelfths. Lobes of the liver very unequal, the right 2¼ inches long, the left 1 inch 10 twelfths; gall-bladder oblong, 7½ twelfths long, 3 twelfths broad. The stomach, *c d*, is small, 1 inch 2 twelfths long, 1 inch in breadth; its lateral muscles thin; the epithelium thin, longitudinally rugous, of a reddish colour. The proventricular glands extremely small, roundish, forming a belt 7 twelfths in width. Intestine, *f g h l m*, 24½ inches long, 6 twelfths wide at the top, but contracting to 4 twelfths; it forms 7 curves; the cœca, *j k*, 1 inch 10 twelfths in breadth. Trachea 5 inches long, from 3½ twelfths to 2½ twelfths long, for 8 twelfths their width is 1 twelfth, afterwards 2½ twelfths, diminishing to 1¾ twelfths, the extremity blunt; rectum 2 inches 3 twelfths long, for 1 inch 4



twelfths in width, then enlarging into an oblong cloaca 10 twelfths in breadth; considerably flattened; the rings 98, unossified, of the same structure as in the Gulls. Bronchi rather wide, of 20 half rings. Muscles as in the Gulls.

The digestive organs of this bird differ from those of the Gulls only in having the cœca much more elongated; the cloaca oblong, instead of being globular, and the stomach less muscular. The tongue differs greatly from that of either the Gulls or Terns.

RICHARDSON'S JAGER.

LESTRIS RICHARDSONII, *Swains.*

PLATE CCCCLII.—MALE AND YOUNG.

This bird, though rare on the coast of the United States, visits the shores of Massachusetts and Maine, where, during winter, it is seen over the bays and inlets, to which various species of Gulls also resort at the same season. It is more shy and difficult to be approached than the Pomarine Jager. Its flight is rapid and greatly protracted; and, like the other species of this genus, it harasses the smaller Gulls and Terns, forcing them to disgorge their food. Dr. RICHARDSON informs us that it breeds in considerable numbers in the barren grounds, at a distance from the coast, and that it feeds on testaceous mollusca, which are plentiful in the small lakes of the fur countries. I am unable to afford any information respecting its habits; nor can I state decidedly the number of eggs which it lays, although I have procured several of them. They measure two inches and three-eighths in length, by one inch and five-eighths in breadth, are of an oval rather pointed form, and have a dull greyish-yellow ground, patched with umber and faint purple, the markings closer towards the larger end.

LESTRIS RICHARDSONII, *Richardson's Jager*, Swains. and Rich. F. Bor. Amer., vol. ii. p. 433.

RICHARDSON'S JAGER, Nutt. Man., vol. ii. p. 319.

RICHARDSON'S JAGER, *Lestris Richardsonii*, Aud. Orn. Biog., vol. iii. p. 503.

N° 91.

Pl. 452.

Richardson Jager

Drawn from Nature by J.J.Audubon F.R.S.F.L.S.

1. Male Adult. 2. Young in Septr.

Lith.ª Printed & Col.ª by J. T. Bowen, Philad.ª

Male, 18½, 40. Young, in September, 15½; wing, 11½.

Coast of Massachusetts and Maine, during winter. Breeds in the northern barren grounds, away from the coast.

Adult Male in spring.

Bill about the length of the head, rather slender, straight, the tip curved. Upper mandible with the dorsal line straight, toward the end curved, the ridge broad and convex, the sides separated from the ridge by a narrow groove, extremely narrow and convex, the edges sharp and inflected, the tip compressed, rather obtuse. Nostrils in the fore part of the nasal groove, nearer the tip than the base, sub-marginal, pervious, linear-oblong, wider anteriorly. Lower mandible with the angle long and narrow, a slight prominence at its extremity, beyond which the dorsal line is straight and ascending, the sides sloping outwards and convex, the edges sharp and inflected, the tip obliquely truncate and rather obtuse.

Head rather small, oblong, much narrowed before. Neck of moderate length. Body rather slender. Feet rather short, and of moderate strength; tibia bare at its lower part; tarsus anteriorly covered with broad decurved scutella, on the sides with oblong scales, behind with smaller oblong prominent scales; hind toe extremely small and elevated, the fore toes of moderate size, connected by reticulated webs, which have their margins convex; the third toe longest, the fourth a little shorter, the second considerably shorter; all covered above with numerous scutella, the lateral ones margined externally with small prominent scales directed forwards. Claws of moderate size, curved, acute, compressed, that of third toe with a sharp inner edge.

The plumage in general is close, elastic, soft, and blended; the feathers on the back and wings rather compact and distinct. Wings very long, rather broad, pointed; primary quills tapering and rounded, the first longest, the rest rapidly graduated; secondary rather short, obliquely rounded. Tail feathers of moderate length, excepting the two middle, which extend beyond the rest and taper to a point, the other feathers broad and rounded, there being twelve in all.

Bill greyish-black, the upper part bluish. Iris brown. Legs and feet black. The general colour of the plumage is of a sooty-brown, the upper part of the head, the primary quills, and the tail darker, the breast and abdomen lighter; the shafts of the primary quills white, of the tail feathers brownish.

Length to end of tail 18½ inches, to end of wings 17; extent of wings 40; wing from flexure 12¾; tail 8½, the middle feathers 2¾ longer than the rest; bill along the back 1 4/12, along the edge of lower mandible 1¾; tarsus 1 8/12; middle toe 1 5/12, its claw 4/12.

Young Bird in September.

Bill light blue, dusky at the end. Iris brown. Tarsi and basal portion of the toes and webs light blue, the rest black. The general colour of the plumage is sooty-brown, lighter on the neck and lower parts; the feathers of the back are all tipped with whitish, and the breast, sides, lower wing-coverts, abdomen, and lower tail-coverts, are undulatingly barred with pale greyish-yellow.

Length to end of tail 15½ inches, to end of wings 13½, to end of claws 13¼; wing from flexure 11½; tail 6¼, the middle feathers only ¾ longer than the rest; bill along the back 1¼; tarsus 1¾; middle toe and claw 1½. Weight 7 oz.

THE ARCTIC JAGER.

LESTRIS PARASITICUS, *Linn.*

PLATE CCCCLIII.—MALE AND FEMALE.

During winter this indefatigable teaser of the smaller Gulls often ranges along our southern coasts as far as the Mexican Gulf, where I have seen it, as well as opposite the shores of the Floridas; but I never met with a single individual in summer, even in the most northern parts, although I had expected to find it breeding on the coasts of Labrador and Newfoundland. Few birds surpass it in power or length of flight. It generally passes through the air at a height of fifty or sixty yards, flying in an easy manner, ranging over the broad bays, on which Gulls of various kinds are engaged in procuring their food. No sooner has it observed that one of them has secured a fish, than it immediately flies towards it and gives chase. It is almost impossible for the Gull to escape, for the warrior, with repeated jerkings of his firm pinions, sweeps towards it with the rapidity of a Peregrine Falcon pouncing on a Duck. Each cut and turn of the Gull only irritates him the more and whets his keen appetite, until by two or three sudden dashes, he forces it to disgorge the food it had so lately swallowed. This done, the poor Gull may go in search of more; the Lestris is now for awhile contented, and alights on the water to feed at leisure. But soon,

Arctic Jager.

Drawn from Nature by J.J. Audubon, F.R.S. F.L.S.

Lith.d Printed & Col.d by J. T. Bowen. Phila.a

perceiving a distant flock of Gulls, he rises on wing and speeds towards them. Renewing his attacks, he now obtains an abundant supply, and at length, when quite gorged, searches for a place on which to alight, unseen by any other of his tribe more powerful than himself. When on wing, its beautiful long tail-feathers seem at times to afford this bird great assistance in executing short sudden turns, which have often brought to my mind the motions of a greyhound while pursuing a hare. By sudden lashings of its tail, it can instantly turn, or arrest its flight. When it is on the water, it keeps that part upright, but when on a rock or a floating piece of timber, it allows it to fall in a graceful manner.

Although usually seen single, or at most in pairs, during the winter, I observed this species in April, on my voyage to the Florida Keys, in flocks of from ten to fifteen, congregated as if for the purpose of returning to the northern regions, where it is said to breed in groups. Mr. SELBY, in treating of this bird, says "It breeds upon several of the Orkney and Shetland Isles, and is gregarious during that period; and the situations selected for nidification are the unfrequented heaths at some distance from the shores. The nest is composed of dry grass and mosses, and its two eggs are of a dark oil green, with irregular blotches of liver-brown. At this season the bird is very courageous, and, like the Common Skua, attacks every intruder upon the limits of its territory, by pouncing and striking at the head with its bill and wings. It also occasionally endeavours to divert attention by feigning accidental lameness." Having received eggs of this bird from individuals who had collected them, I may add that they are broadly rounded at the larger end, rather pointed at the smaller, have a smooth shell, and average two inches four-twelfths in length, by one inch and four and a half eighths in breadth.

M. TEMMINCK, in his Manuel d'Ornithologie, describes the young when about to leave the nest as follows: "Top of the head of a deep grey; sides and upper part of the neck of a light grey, sprinkled with longitudinal brown spots; a black spot before the eyes; lower part of the neck, back, scapulars, small and large wing-coverts, umber-brown, each feather bordered with yellowish-brown, and often with reddish; lower parts irregularly variegated with deep brown and yellowish-brown on a whitish ground; tail-coverts and abdomen transversely barred; quills of the wings and tail blackish, white at their base and on the inner barbs, all terminated with white; the two outer shafts white; tail only rounded; base of the bill yellowish-green, black towards the point; tarsi bluish-grey; base of the toes and membranes white, the rest black, hind claw often white."

In middle age, he says, "all the upper parts are greyish-brown without spots; lower parts of a somewhat lighter tint, and also unspotted; inner base

of the quills and only the upper parts of the tail-feathers pure white, the rest blackish-brown; the two elongated tail-feathers gradually diminish in breadth towards the extremity, which ends in a very attenuated point; bill and feet as in the old individuals."

Captain JAMES CLARK ROSS has informed me by letter, that this species was seen in great numbers during his late voyage towards the Arctic circle; that the Pomarine Lestris was less abundant, and RICHARDSON s very rare.

LESTRIS BUFFONII, Bonap. Syn., p. 364.
LESTRIS PARASITICA, *Arctic Jager*, Swains. and Rich. F. Bor. Amer., vol. ii. p. 430.
ARCTIC JAGER, Nutt. Man., vol. ii. p. 317.
ARCTIC JAGER, *Lestris parasiticus*, Aud. Orn. Biog., vol. iii. p. 470.

Male, 23, 45.

Ranges during winter, along and off the coast, though always in sight of land, as far as the Gulf of Mexico. Breeds in high latitudes.

Adult Male.

Bill about the length of the head, rather slender, straight, the tip curved. Upper mandible with the dorsal line straight, toward the end curved, the ridge broad and convex, the sides separated from the ridge by a narrow groove, extremely narrow and convex, the edges sharp and inflected, the tip compressed, rather obtuse. Nostrils in the fore part of the nasal groove, nearer the tip than the base, sub-marginal, pervious, linear, oblong, wider anteriorly. Lower mandible with the angle long and narrow, a slight prominence at its extremity, beyond which the dorsal line is straight and ascending, the sides sloping outwards and convex, the edges sharp and inflected, the tip obliquely truncate and rather obtuse.

Head rather small, oblong, much narrowed before. Neck of moderate length. Body rather slender. Feet rather short and of moderate strength; tibia bare at its lower part; tarsus anteriorly covered with broad decurved scutella, on the sides with oblong scales, behind with smaller oblong prominent scales; hind toe extremely small and elevated, the fore toes of moderate size, connected by reticulated webs, which have their margins convex; the third toe longest, the fourth not much shorter, all covered above with numerous scutella, the lateral ones margined externally with small prominent scales directed forwards. Claws of moderate size, curved, acute, compressed, that of third toe with a sharp inner edge.

The plumage in general is close, elastic, soft, and blended; the feathers on the back and wings rather compact and distinct. Wings very long, rather broad, pointed; primary quills tapering and rounded, the first longest, the rest rapidly graduated; secondary rather short, rounded. Tail feathers of

moderate length, excepting the two middle, which are extremely elongated and gradually attenuated, the rest broad and rounded, there being twelve in all.

Bill greyish-black, the upper part bluish. Iris brown. Feet black, but with the greater part of the tarsus yellow. The neck and lower parts are white, the former tinged with yellow; upper and fore part of head with the space before the cheeks blackish-brown; the lower part of the hind neck and all the upper parts blackish-grey, the primary quills and tail-feathers brownish-black, the shafts of the former white.

Length to end of tail 23 inches, to end of wings 15; extent of wings 45; wing from flexure 12; tail 12; bill along the back $1\frac{1}{4}$, along the edge of lower mandible $1\frac{3}{4}$; tarsus $1\frac{7}{12}$; middle toe $1\frac{4}{12}$; its claw $\frac{4}{12}$.

Adult Female.

The female resembles the male, but the middle tail-feathers are about three inches shorter.

Genus II.—DIOMEDEA, *Linn.* ALBATROSS.

Bill rather longer than the head, nearly straight, stout, much compressed; upper mandible with its dorsal line much declinate, and nearly straight for a third of its length, then concave, ascending to the unguis, on which it is arched and decurved in the third of a circle, the ridge broad, convex, rounded at the base, separated in its whole length by a groove, margined below beyond the nostrils by a prominent line, from the sides, which are erect and slightly convex, the edges sharp, the unguis decurved, much compressed, with its sides flattened, and the tip acute; nostrils sub-basal, prominent, tabular, having a horny sheath; lower mandible with the angle very narrow, reaching to the tip, and having at its extremity a long slender interposed horny process; the outline of the crura gently ascending, and quite straight, until near the end, when it is a little decurved, the sides ascending, nearly erect, a little convex, the edges sharp, the tip extremely compressed, its

upper edges decurved. Head rather large, ovate; neck of moderate length; body full. Feet rather short, stoutish; tibia bare, below scaly; tarsus roundish, reticulated; toes three, long, slender, outer very little shorter than middle, scaly for half their length, then scutellate. Claws rather small, slender, slightly arched, somewhat obtuse. Plumage full, soft, blended, but rather fine, somewhat compact above. Wings very long, and very narrow, the humerus and cubitus extremely elongated; first quill longest. Tail of twelve broadly rounded feathers, short, rounded.

YELLOW-NOSED ALBATROSS

DIOMEDEA CHLORORHYNCHOS, *Gmel.*

(NOT FIGURED.)

A skin of this bird was sent to me by Mr. TOWNSEND, who procured it in the Pacific Ocean, not far from the mouth of the Columbia river. The species is well known, and one which, unlike most of the others, has been tolerably well described.

DIOMEDEA CHLORORHYNCHOS, Aud. Orn. Biog., vol. v. p. 326.

Length, 37; wing, 21; bill, 5¼; tail, 8¼.

Pacific Ocean, not far from Columbia river.

Bill longer than the head, nearly straight, stout, much compressed. Upper mandible with its dorsal outline much declinate and nearly straight for a third of its length, then concave, ascending to the unguis, on which it is arched and decurved in the third of a circle, the ridge broad, convex, rounded at the base, separated in its whole length by a groove, margined below beyond the nostrils by a prominent line, from the sides, which are erect and convex, the edges sharp, the unguis decurved, much compressed, with its sides flattened, and the tip acute. Nostrils sub-basal, prominent, tubular, having a horny sheath. Lower mandible with the angle very narrow, reaching to the tip, and having at its extremity a long slender interposed horny process; the outline of the crura gently ascending and quite

straight until near the end, when it is a little decurved, the sides ascending, nearly erect, a little convex, the edges sharp, the tip extremely compressed, its upper edges decurved.

Head rather large, ovate, compressed anteriorly; neck of moderate length; body full. Feet rather short, stoutish; tibia bare for three quarters of an inch, covered all round with small angular scales; tarsus roundish, reticulated with small angular and roundish scales; toes three, long, slender, the outer very little shorter than the middle, which exceeds the inner by three-quarters of an inch; they are covered above with small angular scales for half their length, in the rest of their extent with scutella, and connected by emarginate webs, the outer and inner with an external lobed membrane. Claws rather small, slender, slightly arched, rather depressed, convex above, somewhat obtuse.

Plumage full, soft and blended. Wings very long and very narrow, the humerus and cubitus being extremely elongated; the first primary longest, the rest very rapidly diminishing; the secondaries extremely short. Tail of twelve broadly rounded feathers, short, rounded, the lateral feathers one inch shorter than the middle.

Bill black, with the ridge in its entire length and breadth, the tip of the upper mandible, and the crura of the lower along their inferior edge, yellow. Feet yellow, claws yellowish-grey. The head and neck are ash-grey, the fore part of the back shaded into blackish-grey; the wings entirely brownish-black, the shafts of the primaries white, toward the end brownish-black; the hind part of the back, rump, and upper tail-coverts, white; the tail deep grey, the bases and shafts of the feathers white. The loral space is of a darker grey than the rest of the head, and that colour deepens at the fore part of the eye, forming a spot which includes the whole of the upper eyelid, and the anterior half of the lower, of which the other half is white; the lower half of the neck anteriorly, the breast, sides, abdomen, lower tail-coverts, some of the axillaries, and the larger lower wing-coverts white; the rest being brownish-black.

Length to end of tail 37 inches; bill along the ridge $5\frac{3}{12}$, along the edge of lower mandible $4\frac{10}{12}$, its height at the base $1\frac{9}{12}$, at the middle 1, at the angle $1\frac{2}{12}$; wing from flexure 21; tail $8\frac{1}{4}$; bare part of tibia $\frac{3}{4}$; tarsus $3\frac{2}{12}$; inner toe $3\frac{7}{12}$, its claw $\frac{7}{12}$; middle toe $4\frac{5}{12}$, its claw $\frac{9}{12}$; outer toe $4\frac{5}{12}$, its claw $\frac{5}{12}$.

BLACK-FOOTED ALBATROSS.

DIOMEDEA NIGRIPES, *Aud.*

(NOT FIGURED.)

For a specimen of this Albatross, I am indebted to Mr. TOWNSEND, who procured it on the 25th December, 1834, on the Pacific Ocean, in lat. 30°, 44′ N., long. 146°. It is clearly distinct from the other two described in this work, namely the Dusky and the Yellow-nosed; but I have received no information respecting its habits. Not finding any of the meagre notices or descriptions to which I can refer to agree with this bird, I have taken the liberty of giving it a name, being well assured that, should it prove to have been described, some person will kindly correct my mistake.

BLACK-FOOTED ALBATROSS, *Diomedea nigripes*, Aud. Orn. Biog., vol. v. p. 327.

Length, 36; wings 21; bill, 5; tail, 3.

Pacific Ocean, off California.

Male.

Bill longer than the head, nearly straight, stout, compressed. Upper mandible with its dorsal outline straight and declinate until near the middle, when it becomes a little concave, and along the unguis curves in the third of a circle, the ridge convex, very broad and convex at the base, with its basal margin curved in the third of a circle, the ridge separated in its whole length by a groove, margined below by a prominent line, from the sides, which are prominently convex, the edges sharp, the unguis decurved, strong, acute, with the sides a little convex. Nostrils sub-basal, prominent, tubular, having a horny sheath. Lower mandible with the angle narrow, reaching to the tip, and having at its extremity a slender horny interposed process; the outline of the crura gently ascending, slightly convex, toward the end a little concave, at the tip deflected, the sides ascending and considerably convex, but at the base concave, the edges sharp and inflexed, the tip compressed, its upper edges decurved.

Head rather large, ovate, anteriorly compressed; neck of moderate length; body full. Feet rather short, stoutish; tibia bare for an inch and ten-twelfths, reticulated all round with very small convex scales; tarsus rather slender, covered all round with small roundish convex scales; toes three,

long, slender, for half their length covered above with transverse series of flat scales, in the rest of their extent scutellate ; the second ten-twelfths of an inch shorter than the middle, which is scarcely longer than the outer. Claws rather small, slender, slightly arched, rather compressed, somewhat obtuse.

Plumage full, soft and blended. Wings very long and very narrow, the humerus and cubitus being extremely elongated ; the first primary longest, the rest rapidly diminishing ; secondaries extremely short. Tail of twelve rounded feathers, extremely short, rounded, the lateral feathers one inch shorter than the middle.

Bill dusky, the greater part of the lower mandible, and the middle of the upper, tinged with yellowish-brown. Feet and claws black. The fore part of the head, cheeks and throat light dusky-grey, the capistral feathers nearly white, as is a small patch at the posterior angle of the eye ; the upper part of the head, the hind neck, and all the upper parts, including the wings and tail, are of a sooty-brown tinged with grey, as are the lower surface of the wings and the axillaries. The lower parts are of a dull grey tint, deeper on the fore parts and sides of the neck.

Length to end of tail 36 inches ; bill along the ridge 5, along the edge of lower mandible 5 ; wing from flexure 21 ; tail 3 ; bare part of tibia $1\frac{9}{12}$; tarsus $3\frac{9}{12}$; inner toe $1\frac{9}{12}$, its claw $\frac{6}{12}$; middle toe $4\frac{5}{12}$, its claw $\frac{8}{12}$; outer toe $4\frac{7}{12}$, its claw $\frac{6}{12}$.

The three Albatrosses described in this volume may very easily be distinguished by the form of the bill, independently of all other characters. Thus :

Diomedea nigripes has the bill much thicker, or less compressed than the other two species ; its ridge very broad and convex at the base, its basal outline being semicircular and two inches in extent, so that its sides behind overlap and obliterate the sutural space behind the nostrils.

Diomedea chlororhyncos has the bill much compressed, its ridge convex in its whole length, but with its basal outline, although semicircular, only half an inch in extent, so that between its margins and those of the sides of the bill there is behind the eye a space nearly a quarter of an inch in breadth.

Diomedea fusca has the bill as much compressed as that of *D. chlororhyncos ;* but its ridge, in place of being convex, is carinate, and instead of having its base semicircular, as in the other two species, has it running up on the forehead into a very acute angle.

Many other differences might be pointed out, but these will suffice to distinguish the species. It may be remarked, that such descriptions are absolutely necessary to render the species of this genus intelligible ; for at present it seems impossible to form any correct idea from the notices given in books ; and if descriptions are not sufficient to enable one to refer an object to its species, of what use can they be ?

DUSKY ALBATROSS.

DIOMEDEA FUSCA, *Aud.*

PLATE CCCCLIV.—ADULT.

The skin from which I made my drawing of this species was prepared by Mr. TOWNSEND, who procured the bird near the mouth of the Columbia river. Of its habits or distribution I am entirely ignorant. Having failed in finding any figure or description of an Albatross agreeing entirely with it, I have been induced to consider it as new.

DUSKY ALBATROSS, *Diomedea fusca*, Aud. Orn. Biog., vol. v. p. 116.

Adult—length, 34 ; wing, 21 ; tail, 11 ; bill, $4\frac{1}{2}$.
Off the Columbia river.
Adult.

Bill longer than the head, nearly straight, stout, much compressed. Upper mandible with its dorsal outline straight and declinate until about one-third of its length, when it becomes a little concave, and along the unguis curves in the third of a circle, the ridge narrow, pointed at the base, separated in its whole length by a groove margined below by a prominent line from the sides, which are erect and convex, the edges sharp, the unguis decurved, strong, and sharp. Nostrils sub-basal, prominent, tubular, having a horny sheath, and placed rather nearer the ridge than the margin. Lower mandible with the angle narrow, reaching to the tip, and having at its extremity a slender interposed process ; the outline of the crura gently ascending, and nearly straight, towards the end a little deflected, the sides ascending and a little convex, *with a groove in their whole length as far as the unguis*, filled by a membrane, which is wider at the base, the edges sharp, the tip compressed, its upper edges decurved.

Head rather large ; neck of moderate length, body full. Feet rather short, stoutish ; tibia bare for an inch, covered all round with small angular scales ; toes three, long, slender, the two outer a little shorter than the middle, the inner considerably shorter ; they are covered above with small angular scales at the base, in the rest of their extent with scutella, and connected by emarginate webs, the outer and inner with an external membrane. Claws

Dusky Albatross.

Drawn from Nature by J.J.Audubon,F.R.S.F.L.S.

Lith.ª Printed & Col.ª by J. T. Bowen, Phila.ª

rather small, slender, slightly arched, rather depressed, convex above, somewhat obtuse.

Plumage full, soft, and blended. Wings very long and very narrow, the humerus and cubitus being extremely elongated; the first primary longest, the rest very rapidly diminishing; secondaries extremely short. Tail of moderate length, cuneate, of twelve strong feathers, of which the outer are rounded, the inner gradually more acute, the middle feather exceeding the lateral by two inches and three-fourths.

Bill black; feet yellow, claws greyish-white. The head and upper part of the neck are greyish-black, tinged with brown; the rest of the neck, all the lower parts, the back and rump are light brownish-grey; the scapulars darker, the wings coloured like the head; the primary quills and tail-feathers greyish-black, with white shafts. The eyelids are narrowly margined with white feathers, their anterior part excepted.

Length to end of tail 34 inches; bill along the ridge $4\frac{1}{12}$, along the edge of lower mandible $3\frac{5}{12}$; wing from flexure 21; tail 11; bare part of tibia 1; tarsus $3\frac{2}{12}$; inner toe $3\frac{7}{12}$, its claw $\frac{6}{12}$; middle toe $4\frac{4}{12}$, its claw $\frac{9}{12}$; outer toe $4\frac{3}{12}$, its claw $\frac{7}{12}$.

Genus III.—PROCELLARIA, *Linn.* FULMAR.

Bill of about the length of the head, or somewhat shorter, robust, straight, moderately compressed, with the tip decurved; upper mandible with the nostrils dorsal, separated by a thin septum, covered by an elevated horny case, and opening directly forwards, the ridge nearly straight or concave in its outline, laterally sloping or convex, separated by a groove from the sides, which are erect and convex, the edges sharp, inflected, and in their outline slightly recurved from the base to the unguis, which is strong, decurved, and acute; lower mandible with the angle long, narrow, acute, the sides erect, with a groove in their whole length, the edges sharp and direct, the very short dorsal line ascending and slightly concave, the edges decurved at the end. Head rather large, ovate; neck rather short; body full. Feet of moderate length, stout; tibia bare for a short space below; tarsus a little

compressed, reticulated with angular scales; hind toe a slight prominence with a conical claw; fore toes long, slender, scutellate, connected by striated even webs; fourth toe slightly shorter than third. Claws moderate, arched, compressed, rather acute. Plumage full, close, elastic, rather compact above. Wings very long, narrow, the first quill longest. Tail short, or of moderate length, of from twelve to sixteen feathers.

GIGANTIC FULMAR.

PROCELLARIA GIGANTEA. *Linn.*

(NOT FIGURED.)

A specimen of the Gigantic Fulmar, shot at some distance from the mouth of the Columbia river, has been sent to me by Mr. TOWNSEND, along with those of other species of the same genus described in this volume, and which it resembles in form and proportions. The great size of this bird gives it at first sight the appearance of an Albatross. It is described as frequent in the southern seas, gliding silently over the surface of the waters, and subsisting on carcasses of cetacea, seals, birds, and other animal matter; the sailors distinguishing them by the name of "Mother Carey's Geese."

GIGANTIC FULMAR, *Procellaria gigantea*, Aud. Orn. Biog., vol. v. p. 330.

Length, 36; tail, 7½; bill, 4.

Off the Columbia river.

Bill longer than the head, robust, straight, moderately compressed, with the tip decurved. Upper mandible with the nostrils on the ridge, separated only by a thin septum covered by a broad elongated horny case, of which the ridge is nearly straight and carinate, and the base striated; the sides erect and convex, separated by a groove from the nasal plate, as well as from the unguis, which is remarkably strong, curved, laterally convex, and acute, the edges blunt, direct, slightly recurved, along the unguis sharp and decurved. Lower mandible with the angle long and narrow, the sides sloping a little outwards and nearly flat, with a longitudinal seam near the edges,

which are inclinate and sharp, the tip compressed, the dorsal outline ascending and extremely sharp, the edges at the end suddenly decurved.

Head rather large, ovate; neck rather long; body full. Legs short, rather stout; tibia bare for an inch and a quarter; tarsus a little compressed, covered with angular scales, of which the posterior are much smaller. Hind toe elevated, its first phalanx scarcely apparent, its claw large, somewhat conical, obtuse, flattened beneath; the fore toes long, slender, scutellate above, connected by striated entire webs; the fourth toe slightly shorter than the third, including the claws, but otherwise longer; the second toe not much shorter. Claws moderate, arched, compressed, rather acute, that of the third toe with an inner thin edge.

Plumage full, close, elastic; on the back and wings the feathers rather distinct. Wings very long, narrow; primary quills broad, tapering to an obtuse point, the first longest, the rest rapidly graduated; secondary quills broad and rounded. Tail short, much rounded, of sixteen broad, rounded feathers, of which the lateral are an inch and a half shorter than the middle.

Bill and feet yellow. The general colour of the plumage is a deep dingy grey or blackish-grey, of tint similar to that of the young of *Procellaria glacialis* and *P. pacifica*, but much deeper. It is considerably lighter on the lower parts, and especially on the lower surface of the wings.

Length to end of tail 36 inches; bill along the ridge 4, along the edge of lower mandible $3\frac{1}{2}$; length of nasal case $1\frac{1}{12}$; wing from flexure $1\frac{9}{12}$; tail $7\frac{1}{2}$; tarsus $3\frac{1}{4}$; first toe $\frac{1}{12}$; its claw $\frac{5}{12}$; second toe $3\frac{1}{2}$, its claw $\frac{7}{12}$; third toe $4\frac{5}{12}$, its claw $\frac{11}{12}$; fourth toe $4\frac{1}{4}$, its claw $\frac{1}{12}$.

THE COMMON FULMAR

PROCELLARIA GRACIALIS, *Linn.*

PLATE CCCCLV.—MALE.

Though not a large bird, the Fulmar is possessed of considerable strength, and has a powerful and sustained flight. In autumn and winter it is seen on our eastern coasts, from which it retires early in summer, to betake itself to the northern retreats in which it rears its young. I have never seen it farther south than Long Island, but I have often found it on the banks of Newfoundland, and in the space intervening between them and our shores. From the beginning of September to that of May it may be said to be pretty common, especially around the banks, to which the cod-fishers resort, and where it feeds chiefly on the rejected garbage.

One calm day in August, when on a voyage from England to New York, I procured several Fulmars. They came up and alighted near the boat, whenever we threw any thing overboard, and did not seem to be in the least alarmed by the report of a gun. In one instance I shot one on the water, when it was so near that I could distinctly see the colour of its eye. A great number of them were swimming in small detached flocks of eight or ten, their colour at a distance appearing as if pure white, and contrasting beautifully with the dark blue of the sea. They floated very buoyantly, some swimming about with great ease, others to appearance sound asleep. Most of them had the wing and tail-feathers ragged, and some were much soiled with greasy matter, which gave them an unpleasant appearance. Those which were caught, on being wounded, emitted quantities of oily matter by their nostrils, and disgorged much of the same substance; but did not attempt to bite, which seemed strange in birds having the bill so powerful and hooked. They fly with less grace than the Shearwaters, proceeding in a direct line, and at a small height, towards the objects on which they feed.

I was much disappointed at not finding the Fulmar along the rocky shores of Labrador, where I had expected to meet with it, as it is regularly observed in spring moving northward in files opposite the entrance of the Straits of Belle Isle. Its passage towards the Arctic Regions has been observed by Captain SABINE on the coast of Greenland. "Whilst the ships,"

Fulmar Petrel.

Adult Male Summer Plumage.

Drawn from Nature by J.J.Audubon FRSFLS.

Lith.d Printed & Col.d by J.T.Bowen Philad.a

he says, "were detained by the ice in Jacob's Bay, in latitude 71°, from the 24th of June to the 3d of July. Fulmars were passing in a continual stream to the northward, in numbers inferior only to the flight of the Passenger Pigeon in America." While on my way to Labrador, I was told that they bred on the Seal Islands off the entrance of the Bay of Fundy. The egg, which is of a regular ovate form, with a smooth brittle pure white shell, measures two inches and seven-eighths in length, by two inches in breadth.

My much esteemed friend Mr. SELBY, in his Illustrations of British Ornithology, gives the following account of this species. "The steep and rocky St. Kilda, one of the western islands of Scotland, is the only locality within the British dominions annually resorted to by the Fulmar, the rest of the Scottish and our more southern coasts being rarely visited even by stragglers. Upon St. Kilda these birds are found in vast numbers during the spring and summer months, breeding in the caverns and holes of the rocks; and, from the various uses to which the down, feathers, and oil of the young are applied, contribute essentially to the comfort of the inhabitants. They lay but one egg each, white, and of a large size, with a shell of very brittle texture. The young are hatched about the middle of June, and are fed with *oil* thrown up by the parents (the produce of the food upon which they subsist), and, as soon as fledged, are eagerly sought for by the natives, although often at the risk of life, in scaling the tremendous and overhanging cliffs in which they nestle. Like most of the group, these birds have the power of ejecting oil with much force through their tubular nostrils, which is used as the principal mode of defence; it becomes an essential point, therefore, that they should be taken and killed by surprise, in order to prevent the loss of a liquid so requisite for the comfort of the inhabitants, by supplying them with the necessary fuel for their lamps. The Fulmar is of voracious appetite, feeding upon all sorts of animal substance, particularly of an oily nature, such as the blubber of whales, seals, &c.; and for this purpose it follows in great numbers the track of the whale vessels, and is so greedy of its favourite food, as to be often seen alighting upon the wounded animal, when not quite dead, and immediately proceeding to break the skin with its strong hooked bill, and gorging itself with the blubber to repletion."

The Rev. Mr. SCORESBY, in his "Arctic Regions," vol. i. p. 528, gives the following account of its habits as observed by him in the polar seas.

"The Fulmar is the constant companion of the whale-fisher. It joins his ship immediately on passing the Shetland Islands, and accompanies it through the trackless ocean to the highest accessible latitudes. It keeps an eager watch for anything thrown overboard; the smallest particle of fatty substance can scarcely escape it. As such, a hook baited with a piece of fat

meat or blubber, and towed by a long twine over the ship's stern, is a means employed by the sailor boys for taking them. In the spring of the year, before they have glutted themselves too frequently with the fat of the whale, they may be eaten; and when cleared of the skin, and of every particle of yellow fatty substance lying beneath it, and well soaked in water, they are pretty good, particularly in 'sea pies.' They are remarkably easy and swift on the wing. They can fly to windward in the highest storms, and rest on the water with great composure in the most tremendous seas. But it is observed that, in heavy gales, they fly extremely low, generally skimming along the surface of the water. The Fulmar walks awkwardly, and with the legs so bent that the feet almost touch the belly. When on ice it rests with its body on the surface, and presents its breast to the wind. Like the Duck, it sometimes turns its head backward, and conceals its bill beneath its wing.

"Fulmars are extremely greedy of the fat of the whale. Though few should be seen when a whale is about being captured, yet, as soon as the flensing process commences, they rush in from all quarters, and frequently accumulate to many thousands in number. They then occupy the greasy track of the ship; and, being audaciously greedy, fearlessly advance within a few yards of the men employed in cutting up the whale. If, indeed, the fragments of fat do not float sufficiently away, they approach so near the scene of operations, that they are knocked down with boat hooks in great numbers, and sometimes taken up by the hand. The sea immediately about the ship's stern is sometimes so completely covered with them, that a stone can scarcely be thrown overboard without striking one of them. When anything is thus cast among them, those nearest the spot where it falls take the alarm, and these exciting some fear in others more remote, sometimes put a thousand of them in motion; but as, in rising into the air, they assist their wings, for the first few yards, by striking the water with their feet, there is produced by such a number of them, a loud and most singular splashing. It is highly amusing to observe the voracity with which they seize the pieces of fat that fall in their way; the size and quantity of the pieces they take at a meal; the curious chuckling noise which in their anxiety for dispatch they always make; and the jealousy with which they view, and the boldness with which they attack, any of this species that are engaged in devouring the finest morsels. They frequently glut themselves so completely, that they are unable to fly; in which case, when they are not relieved by a quantity being disgorged, they endeavour to get on the nearest piece of ice, where they rest until the advancement of digestion restores their wonted powers. Then, if opportunity admit, they return with the same gust to the banquet as before; and though numbers of the species may

be killed, and allowed to float about among them, they appear unconscious of danger to themselves.

"The Fulmar never dives, but when incited to it by the appearance of a morsel of fat under water. When in close view of any men, it keeps a continual watch both on the men and its prey ; having its feet continually in motion, and yet perhaps not moving at all through the water. Its boldness increases with the numbers of its species that surround it. It is a very hardy bird. Its feathers being thick it is not easily killed with a blow. Its bite, from the crookedness, strength, and sharpness of its bill, is very severe.

"When carrion is scarce, the Fulmars follow the living whale ; and sometimes, by their peculiar motions, when hovering at the surface of the water, point out to the fisher the position of the animal of which he is in pursuit. They cannot make much impression on the dead whale, until some more powerful animal tears away the skin ; the epidermis and rete mucosum they entirely remove, but the true skin is too tough for them to make way through it."

PROCELLARIA GLACIALIS, Bonap. Syn., p. 369.
FULMAR PETREL, Nutt. Man., vol. ii. p. 330.
FULMAR PETREL, *Procellaria glacialis*, Aud. Orn. Biog., vol. iii. p. 446.

Male, 8, 18.

Not uncommon off the coast, from New York to Nova Scotia. Abundant on the banks of Newfoundland. Breeds in high latitudes.

Adult Male in summer.

Bill shorter than the head, robust, straight, slightly compressed, the tip curved. Upper mandible with the nostrils on the ridge, separated only by a thin partition, covered by an elevated horny case, and opening directly forwards, the sides convex, and separated by a groove from the nasal plate, as well as from the unguis, which is remarkably strong, curved and acute, the edges sharp, inflected, and slightly curved. Lower mandible with the angle long, rather wide, acute, the sides erect but convex, the edges sharp and inflected, the very short dorsal line ascending and slightly concave, the edges decurved at the end.

Head rather large, ovate. Neck rather short. Body full. Feet of moderate length, stout ; tibia bare for a short space below ; tarsus a little compressed, rather sharp before, covered all round with reticular scales, of which those on the anterior and posterior ridges are much smaller. Hind toe a slight prominence, with a conical obtuse claw ; the fore toes long, slender, scutellate above, connected by striated entire webs, the fourth a little longer than the third, the second not much shorter. Claws rather small, arched, compressed, rather acute, that of the third toe with an inner thin edge.

Plumage free, close, elastic, blended; on the back and wings the feathers rather distinct. Wings long; primary quills rather broad, tapering, acuminate, the first longest, the rest graduated; secondary broad and rounded. Tail rather short, slightly rounded, of twelve broad, rounded feathers.

Bill, iris, and feet yellow, the latter tinged with green. The head, neck, and lower parts, are pure white; the back and wings light greyish-blue, the rump paler, the tail bluish-white: the primary quills and their coverts blackish-brown.

Length to end of tail 16½ inches, to end of wings 17, to end of claws 11¼; extent of wings 30; wing from flexure 13; tail 4¼; bill along the back 1$\frac{9}{12}$, along the edge of lower mandible 2$\frac{2}{12}$; tarsus 2; outer toe 1$\frac{8}{12}$, its claw $\frac{4}{12}$. Weight 1 lb. 4 oz.

The Female is similar to the male.

PACIFIC FULMAR.

PROCELLARIA PACIFICA, *Aud.*

(NOT FIGURED.)

Three skins transmitted to me by Mr. TOWNSEND appear to belong to two species of the Fulmar genus, distinct from that of the Atlantic seas. The first of these species I have named as above. An adult individual resembles the common *Procellaria glacialis* in form, proportions, and colour, but differs in having the bill much smaller, more compressed, with the angle of the lower mandible narrower, and the tips of both very much inferior in strength. It is about the same size as the species just mentioned, and shews no remarkable difference in the wings or tail. Besides being more compressed, its bill presents a character, which, if universal, is perfectly distinctive; the upper outline of the united nasal tubes is concave in the Atlantic Fulmar, and its ridge flattened; whereas the outline of these tubes is straight in the Pacific species, and its ridge distinctly carinate.

PACIFIC FULMAR, *Procellaria pacifica*, Aud. Orn. Biog., vol. v. p. 331.

Adult, 18; wing, 12¾; tail, 4¾; bill, 1¾.

North-west coast of America. Abundant.

Adult.

Bill shorter than the head, robust, straight, compressed, the tip curved. Upper mandible with the nostrils on the ridge, separated by a thin septum, covered by an elevated horny case, and opening directly forwards, the sides erect, convex, and separated by a groove from the nasal plate, as well as from the unguis, which is strong, decurved, and acute, the edges sharp, inflected, and slightly recurved from the base to the unguis. Lower mandible with the angle long, narrow, acute, the sides erect, with a groove in their whole length, the edges sharp and direct, the very short dorsal line ascending and slightly concave, the edges decurved at the end.

Head rather large, ovate; neck rather short. Feet of moderate length, stout; tibia bare for a short space below; tarsus a little compressed, covered all round with reticular scales, of which those on the anterior and posterior thin ridges are much smaller. Hind toe a slight prominence, with a conical rather obtuse claw; the fore toes long, slender, scutellate above, connected by striated entire webs, the fourth a little longer than the third, the second or inner not much shorter. Claws rather small, slightly arched, compressed, acute, that of the third toe with an inner thin edge. Plumage full, close, elastic, blended; on the back and wings the feathers rather distinct. Wings long: primary quills rather broad, tapering to a roundish point having a minute acumen, the first four-twelfths longer than the second, which exceeds the third by half an inch; secondary quills broad and rounded. Tail short, rounded, of fourteen rounded feathers, of which the lateral are one inch shorter than the middle; the lower tail-coverts very strong and of the same length as the tail-feathers.

Bill and feet yellow. The head, neck, and lower parts are pure white; the back and wings light greyish-blue, but most of the feathers, including those of the tail, becoming dark grey toward the end; the primary quills and their coverts are blackish-brown, tinged with grey.

Length to end of tail 18 inches; bill along the ridge $1\frac{9}{12}$; nasal case $\frac{6}{12}$; wing from flexure $12\frac{9}{12}$; tail $4\frac{3}{4}$; tarsus $1\frac{11}{12}$; hind toe $\frac{9}{12}$, its claw $\frac{3}{12}$; second toe $1\frac{10}{12}$, its claw $\frac{5}{12}$; third toe $2\frac{2}{12}$, its claw $\frac{7}{12}$; fourth toe $2\frac{1}{4}$, its claw $\frac{4}{12}$.

The young bird is of a uniform dull light dusky-grey colour; a patch before the eye and the primary quills dusky. Its bill and feet are also yellow; the former as in the adult; the outline of its nasal case straight, its ridge carinate.

Length to end of tail 19½ inches; bill along the ridge $1\frac{10}{12}$, nasal case $\frac{7}{12}$; wing from flexure $12\frac{9}{12}$; tail $4\frac{9}{12}$.

SLENDER-BILLED FULMAR.

PROCELLARIA TENUIROSTRIS, *Aud.*

(NOT FIGURED.)

This species agrees in general with the last described; but its bill is much more elongated, comparatively slender, and with the nasal case, half of the unguis of the upper mandible, and the tip of the lower, black. The outline of the nasal case is a little concave, and its ridge is somewhat carinate. Whether this individual be of another species, or of the same, having an accidentally elongated bill, cannot perhaps be determined without a series of specimens; but it is probably a true species, as neither of the other two have the bill black in any part or at any period. Supposing it to be distinct, I have named it the Slender-billed Fulmar, *Procellaria tenuirostris.*

The following note from Mr. TOWNSEND was appended to this specimen: —"Within a day's sail from the mouth of the Columbia river. Its habits are very similar to those of *Procellaria capensis*, keeping constantly around the vessel, and frequently alighting in her wake for the purpose of feeding. They are easily taken with a hook baited with pork, and at times, particularly during a gale, they are so tame as almost to allow themselves to be taken with the hand. The stomachs of most of those that I captured were found to contain a species of sepia and grease."

Length to end of tail 18½ inches; bill along the ridge $2\frac{1}{12}$; nasal case $\frac{7}{12}$; wing from flexure 13; tail 5; tarsus $1\frac{10}{12}$; hind toe $\frac{1}{12}$, its claw $\frac{3}{12}$; outer toe $2\frac{3}{12}$, its claw $\frac{4}{12}$.

SLENDER-BILLED FULMAR, *Procellaria tenuirostris*, Aud. Orn. Biog., vol. v. p. 333.

Length, 18½; wing, 13; tail, 5; bill, $2\frac{1}{12}$.
Off the Columbia river. Common.

Genus IV.—PUFFINUS, *Briss.* SHEARWATER.

Bill of the length of the head, rather slender, nearly as deep as broad at the base, much compressed toward the end, nearly straight, being slightly recurved, with the tips decurved; upper mandible with the cere at the base, extending narrow to the nostrils, which are dorsal, each covered with a lateral convex plate, and opening anteriorly, with an elliptical aperture, dorsal line as far as the nostrils nearly straight, then suddenly deflected, afterwards slightly concave, towards the end decurved, the ridge very broad and convex at the base, narrower beyond the nostrils, from which a groove runs obliquely on each side, sides convex, nearly erect, edges sharp, tip or unguis strong, decurved, much compressed, very acute; lower mandible with the angle very long and narrow, the dorsal line beyond it decurved, the sides sloping outwards, the edges sharp and inflected, the unguis decurved, acute. Head rather large, oblong; neck rather short; body moderate. Feet rather large; tibia bare for a short space below; tarsus of moderate length, compressed, reticulated with angular scales; hind toe obsolete, but with a small conical deflected claw; fore toes long, slender, connected by webs; outer toe slightly longer than third. Claws arched, compressed, acute. Plumage full, close, elastic, rather compact above. Wings very long, narrow, the first quill longest. Tail of moderate length, graduated, of twelve rounded feathers.

THE WANDERING SHEARWATER

PUFFINUS CINEREUS, *Lath.*

PLATE CCCCLVI.—MALE.

I have found this species ranging from the Gulf of St. Lawrence to that of Mexico, but have very seldom seen it near the coast. While sailing round Nova Scotia, on my way to Labrador, early in June, I observed one evening about sunset, a great number flying from the rocky shores, which induced me to think that they bred there. Scarcely one was to be seen during the day, and this circumstance strengthened my opinion, as I was aware that these birds are in the habit of remaining about their nests at that time. In September the case is very different; for they are then seen far out at sea, at all hours by day and through the night.

In calm weather, they are fond of alighting on the water, in company with the Fulmars, and are then easily approached. They swim buoyantly, and have a graceful appearance while playing among themselves. Two that had been caught with hooks, walked as well as Ducks, and made no pretence of sitting on their rumps, as some writers have said they do. On being approached, they opened their bills, raised their feathers, and squirted an oily substance through their nostrils, which they continued to do when held in the hand, at the same time scratching with their sharp claws and bills. They refused all sorts of food; and as they were unpleasant pets, they were set at liberty. To my great surprise, instead of flying directly off, as I expected, they launched toward the water, dived several yards obliquely, and on coming to the surface, splashed and washed themselves for several minutes before they took to wing, when they flew away with their usual ease and grace.

The flight of this wanderer of the ocean is extremely rapid and protracted. When it blows hard, it skims along the troughs of the waves on extended wings in large curves, shewing its upper and lower parts alternately, evidently with the view of being aided by the wind. In calm weather its flight is much lower and less rapid, and it rarely throws its body sideways, but seems to feed more abundantly than during boisterous weather. Like the small Petrels, it frequently uses its feet to support itself on the surface, without actually alighting. In the stomach of those which I opened, I

Wandering Shearwater.

Male.

Drawn from Nature by J.J. Audubon F.R.S.F.L.S.

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found fishes, portions of crabs, sea-weeds, and oily substances. It does not appear that this species goes far north, as was formerly supposed; for none of the late northern voyagers mention having seen it, although they found the Fulmar abundant.

PUFFINUS CINEREUS, Bonap. Syn., p. 370.
CINEREOUS PUFFIN, Nutt. Man., vol. ii. p. 334.
WANDERING SHEARWATER, *Puffinus cinereus*. Aud. Orn. Biog., vol. iii. p. 555.

Male, 20, 45.

Common off the shores, from the Gulf of St. Lawrence to that of Mexico. Abundant off Nova Scotia. Ranges to a great distance at sea in autumn and winter.

Adult Male.

Bill about the same length as the head, rather slender, nearly as deep as broad at the base, compressed towards the end, slightly curved upwards, with the tips decurved. Upper mandible with a cere at the base extending narrow to the nostrils, which are placed above, each covered with a lateral convex plate, and open anteriorly, with an elliptical aperture; the dorsal line as far as the nostrils nearly straight, then suddenly deflected, after which it is slightly concave, but towards the tip incurved, the ridge very broad and convex at the base, narrower beyond the nostrils, from which a groove proceeds obliquely to the commencement of the hooked tip; the sides convex and nearly erect, the edges sharp. Lower mandible with the angle very long and narrow, the dorsal line beyond it, decurved, the sides sloping outwards, the edges sharp and inflected, the curved tip grooved above.

Head rather large, oblong, rather compressed. Neck short and stout. Body moderate, deeper than broad. Wings long. Feet rather large; tibia bare for a short space below; tarsus of moderate length, compressed, covered all round with angular scales, the hind ones much smaller; hind toe obsolete, but with a small conical deflected claw; fore toes long, slender, connected by reticulated webs, the lateral ones with thin edges; outer toe slightly longer than the third, but with a shorter claw, the first considerably shorter; toes scutellate above; claws arched, compressed, acute, that of third toe with an enlarged sharp edge.

Plumage soft, close, blended; on the back compact, the feathers rounded. Wings very long, pointed; primary quills tapering, the first longest, the second considerably shorter, the rest rapidly graduated; secondaries short, broad, obliquely rounded, the inner not elongated. Tail of moderate length, graduated, of twelve rounded feathers.

Bill yellowish-green, the tips brownish-black, tinged with green. Edges

of eyelids dark grey; iris brown. Feet light greenish-grey, webs and claws yellowish flesh-colour. The upper parts in general are deep brown, the hind neck paler and tinged with grey; the primary quills and tail brownish-black. The lower parts are greyish-white; the lower wing-coverts white, those next the edge of the wing greyish-black towards the end, the axillary feathers white, greyish-brown towards the end, lower tail-coverts similar.

Length to end of tail 20 inches, to end of wings 21¼, to end of claws 21¼; extent of wings 45; wing from flexure 13¼; tail 5; bill along the back 2$\frac{4}{12}$, along the edge of lower mandible 2¾; tarsus 2¼; middle toe 2½, its claw ½. Weight 1 lb. 9¾ oz.

THE MANKS SHEARWATER.

PUFFINUS ANGLORUM, *Ray.*

PLATE CCCCLVII.—ADULT.

Although I have procured this species to the westward of the banks of Newfoundland, or between their soundings and the American coast, I am unable to say anything of importance respecting its habits as observed by myself. This species formerly inhabited a small islet close to the Isle of Man, but appears to have now entirely deserted it. In the Orkneys, however, it is still abundant, and the eggs and young are in much request there. It arrives in March, and, when the young are able to fly, betakes itself to the open sea, disappearing towards the approach of winter. The British writers who have described it inform us, that it stands nearly erect, flies with great rapidity, feeds on marine animal substances of all kinds, and, when taken, squirts out an oily fluid from its nostrils in the manner of the Petrels. It is said to breed in burrows, and to lay only a single egg, of a white colour and elliptical form, about the size of that of a domestic fowl.

PUFFINUS ANGLORUM, Bonap. Syn., p. 371.
SHEARWATER PETREL, Nutt. Man., vol. ii. p. 336.
MANKS SHEARWATER, *Puffinus anglorum*, Aud. Orn. Biog., vol. iii. p. 604.

Adult, 15, 32.

Manks Shearwater

Male.

Drawn from Nature by J.J.Audubon F.R.S.F.L.S.

Lith.d Printed & Col.d by J. T. Bowen, Philad.a

Not uncommon off the coast of Maine during summer. Breeds on Sable Island, off Nova Scotia. Ranges, at times, to great distances seaward.

Adult.

Bill about the length of the head, rather slender, a little compressed, straightish, the tips curved. Upper mandible with the dorsal line convex, and sloping at the base, afterwards slightly concave, on the unguis curved, the ridge broadly convex, narrowed towards the end, the sides convex, the edges sharp and slightly inflected; the unguis stout, curved, rather acute. Nostrils tubular, approximated, dorsal; the narrow nasal groove extending to the unguis. Lower mandible with the angle very long and narrow, the short dorsal line beyond it decurved, the sides convex and sloping inwards, the edges sharp and inflected.

Head of moderate size, ovate, narrowed before. Neck of moderate length. Body elongated. Feet of moderate size; tibia feathered to near the joint; tarsus compressed, anteriorly and posteriorly sharp, covered all over with diversiform scales, of which a series in the inner side is scutelliform. Toes rather long, slender, excepting the first, which is a mere conical knob principally composed of the claw; anterior toes connected by striated webs, of which the margin is concave, scutellate above, the third and fourth longest and about equal. Claws small, compressed, slightly arched, obtuse, that of third toe with the inner edge a little dilated.

Plumage dense, soft, blended, on the upper parts rather compact. Feathers of the fore part of the head very short. Wings long, sharp; primaries tapering, rounded; first longest, the rest regularly graduated; secondaries rather short, rounded. Tail rounded, of twelve feathers.

Bill deep greenish-black. Iris dark brown. Inner and middle of outer side of tibia dingy orange, the rest greenish-black, as is the fourth toe and outer side of the third, the inner side of the latter and the whole of the second dingy orange; the webs much paler; claws brownish-black. All the upper parts are brownish-black, the lower white.

Length to end of tail 15 inches, to end of wings 15½, to end of claws 16; extent of wings 32; wing from flexure 9¾; tail 3½; bill along the back 1$\frac{8}{12}$, along the edge of lower mandible 1$\frac{10}{12}$; tarsus 1$\frac{11}{12}$; middle toe 1$\frac{8}{12}$, its claw $\frac{4}{12}$. Weight 15 oz.

The Female is similar to the male.

THE DUSKY SHEARWATER

PUFFINUS OBSCURUS, *Lath.*

PLATE CCCCLVIII.—MALE.

On the 26th of June, 1826, while becalmed on the Gulf of Mexico, off the western shores of Florida, I observed that the birds of this species, of which some had been seen daily since we left the mouth of the Mississippi, had become very numerous. The mate of the vessel killed four at one shot, and, at my request, brought them on board. From one of them I drew the figure which has been engraved. The notes made at the time are now before me, and afford me the means of presenting you with a short account of the habits of this bird.

They skim very low over the sea in search of the floating bunches of marine plants, usually called the *gulf weed*, so abundant here as sometimes to occupy a space of half an acre or more. In proceeding, they flap their wings six or seven times in succession, and then sail for three or four seconds with great ease, having their tail much spread, and their long wings extended at right angles with the body. On approaching a mass of weeds, they raise their wings obliquely, drop their legs and feet, run as it were on the water, and at length alight on the sea, where they swim with as much ease as Ducks, and dive freely, at times passing several feet under the surface in pursuit of the fishes, which, on perceiving their enemy, swim off, but are frequently seized with great agility. Four or five, sometimes fifteen or twenty of these birds, will thus alight, and, during their stay about the weeds, dive, flutter, and swim, with all the gaiety of a flock of Ducks newly alighted on a pond. Many Gulls of different kinds hover over the spot, vociferating their anger and disappointment at not being so well qualified for supplying themselves with the same delicate fare. No sooner have all the fishes disappeared than the Petrels rise, disperse, and extend their flight in search of more, returning perhaps in awhile to the same spot. I heard no sound or note from any of them, although many came within twenty yards of the ship and alighted there. Whenever an individual settled in a spot, many others flew up directly and joined it. At times, as if by way of resting themselves, they alighted, swam lightly, and dipped their bills frequently in the water, in the manner of Mergansers.

Dusky Shearwater.

Male in Spring.

Drawn from Nature by J.J. Audubon, F.R.S.F.L.S.

Lith.ª Printed & Col.ª by J. T. Bowen, Phila.ª

I preserved the skins of the four specimens procured. One of them I sent to the Academy of Natural Sciences of Philadelphia, by Captain JOHN R. BUTLER, of the ship Thalia, then bound from Havana to Minorca. Two others were presented to my excellent friend Dr. TRAILL, on my first becoming acquainted with him at Liverpool.

I found the wings of this species strong and muscular for its size, this structure being essentially requisite for birds that traverse such large expanses of water, and are liable to be overtaken by heavy squalls. The stomach resembles a leather purse, four inches in length, and was much distended with fishes of various kinds, partially digested or entire. The œsophagus is capable of being greatly expanded. Some of the fishes were two and a half inches in length, and one in depth. The flesh of this Petrel was fat, but tough, with a strong smell, and unfit for food; for, on tasting it, as is my practice, I found it to resemble that of the porpoises. No difference is perceptible in the sexes.

While on board the United States revenue cutter Marion, and in the waters of the Gulf Stream opposite Cape Florida, I saw a flock of these birds, which, on our sailing among them, would scarcely swim off from our bows, they being apparently gorged with food. As we were running at the rate of about ten knots, we procured none of them. I have also seen this species off Sandy Hook.

PUFFINUS OBSCURUS, Bonap. Syn., p. 371.
DUSKY PETREL, Nutt. Man., vol. ii. p. 337.
DUSKY PETREL, *Puffinus obscurus*, Aud. Orn. Biog., vol. iii. p. 620.

Male, 11, 26.

Abundant during summer in the Gulf of Mexico, and off the coast eastward to Georgia. Some wander as far as Long Island.

Adult Male.

Bill about the length of the head, straight, somewhat cylindrical, the tips curved. Nostrils tubular, separate, inclosed in a horny sheath, and dorsal, the outline straight, curved on the unguis, the sides nearly erect, convex, the edges sharp, hard, and inflected, the tip decurved, strong. Lower mandible straight, the angle very narrow and extending nearly to the tip, the dorsal line beyond it decurved, the sides convex and inclining inwards, the edges sharp and inflected.

Head of moderate size. Neck of ordinary length; body ovate. Feet stout; tibia bare a short way above the joint; tarsus of moderate length, rather stout, reticulate; hind toe a very slight knob, with a small conical claw; fore toes long, slender, connected by reticulated webs with concave

margins, the outer toe slightly longer than the third. Claws small, slightly arched, compressed, obtuse.

Plumage soft, full; the feathers rounded, those of the back and wings rather compact. Wings long; primaries tapering, rounded, the first longest, the rest rapidly graduated; secondaries of moderate length, rounded. Tail rather short, much rounded, of twelve feathers.

Bill light blue, the tips black, mouth light blue. Edges of eyelids light blue, iris bluish-black. Outside of tarsus and toes indigo-black, inside and webs pale yellowish-flesh-colour; claws bluish-black. The upper parts are sooty-black, the lower pure white.

Length to end of tail 11 inches, to end of wings $10\frac{1}{2}$, to end of claws $11\frac{1}{4}$; extent of wings $26\frac{1}{2}$; bill along the back $1\frac{4}{12}$, along the edge of lower mandible $1\frac{3}{4}$; tarsus $1\frac{1}{2}$; outer toe 2, its claw $\frac{2}{12}$.

Genus V.—THALASSIDROMA, *Vigors.* PETREL.

Bill shorter than the head, slender, as high as broad at the base, extremely compressed at the end; upper mandible with the nostrils dorsal forming a tube on its ridge at the base, on which the dorsal line is concave and ascending, then abrupt, afterwards, for a short space, straight, and lastly decurved, the sides separated by a groove, convex, the edges sharp and inflected, the tip decurved, slender, acute; lower mandible with the angle rather long, narrow, and pointed, the dorsal line beyond it decurved, the sides erect, the edges sharp, the tip decurved, acute. Head of moderate size, rounded above; neck short; body rather slender. Feet rather long, slender; tibia bare at its lower part; tarsus slender, reticulate; hind toe minute, with a conical deflected claw; anterior toes of moderate length, slender, scutellate, webbed, the third and fourth about equal. Claws slender, arched, compressed, acute. Plumage very soft and blended, the feathers distinct only on the wings, which are very long, with the primaries a little incurved toward the end, the second longest, the first and fourth about equal; tail

Leach's Petrel. Forked-tailed Petrel.

Drawn from Nature by J.J. Audubon, F.R.S. F.L.S. 1. Male 2. Female. Lith.ª Printed & Col.ª by J. T. Bowen, Phila.ª

emarginate or even, of twelve feathers. Tongue much flattened, tapering to a horny point; œsophagus wide, within the thorax enormously distended, and with the proventriculus forming an ovate sac, which is recurved; stomach very small; intestine short, of moderate width; cœca small; cloaca globular.

LEACH'S PETREL.—FORKED-TAILED PETREL.

THALASSIDROMA LEACHII, *Temm.*

PLATE CCCCLIX.—MALE AND FEMALE.

Before describing the habits of this bird, I think it necessary to speak of the three distinct species which are at times found near our coasts, and of which I have found two breeding within the Union. The present species is the largest; that named after WILSON the next in size; and the one called the Stormy Petrel the least. Until I had met with the whole of these species near our coast, I, like others, thought that the last mentioned kept nearer to Europe than it in reality does at certain seasons.

In August, 1831, I was on board of the American packet-ship Columbia commanded by my friend JOSEPH C. DELANO, Esq., who had promised that, in case of a calm occurring, he would allow me to have a boat manned to go in search of birds. The day is not given, because I never keep a journal while crossing the Atlantic; but as I had left England on the first of the month, and was then on the banks of Newfoundland, it must have been towards the latter part of it, when the weather suddenly became quite calm and beautiful. "Mother Carey's Chickens" were by hundreds around the noble ship, and although ill in consequence of the sickness which never leaves me at sea, I asked for a boat and some hands to row me about for an hour or so. This was granted, guns and ammunition were placed in the yawl, and my assistant, Mr. HENRY WARD of London, an officer, and two sailors, accompanied me. We had three guns, which were alternately loaded and handed to me. In the course of about an hour, twenty-five or thirty Petrels were shot, together with some Fulmars. Had you been looking on, you might perhaps have laughed at me on seeing that the moment after I fired, I was obliged to lean over the side of the bark to relieve myself from the dis-

tressing state of my stomach. On returning to the ship, my companions nimbly ascended the chains; but although when on land I am pretty firm and active, I was now quite unfit for service, and therefore was hoisted in a chair. Once on deck, I laid myself down on a mattrass, my wife attended to me, and I gradually became relieved, as the ship stood, to use the words of my kind captain, "as still as if on the stocks." There were the dead birds nicely arranged on a board by my side; the wounded ones were placed in a cage, and I began to examine them all with care. To my great surprise, I found among them all the three species mentioned above. Sixteen of these birds were beautifully prepared by Mr. WARD, and the rest were placed in spirits, after I had made correct outlines of each species, and taken their exact dimensions and weight. The drawings, however, I was unable to finish on account of the giddiness, which seldom leaves me while at sea. The calm continued the whole of the next day, and, laying myself down on the top of the round-house, I had ample opportunities of observing the habits of the three species, while thus at a distance from land.

My esteemed friend the Prince of MUSIGNANO has stated that the Forked-tailed Petrel is less numerous near the American coast than the species named after WILSON. It is true that it rarely goes so far south, but in the vicinity of Massachusetts, and from thence to Newfoundland, it is by far the most abundant of the two; and it breeds on all suitable places from the Islands of Mount Desert to the last mentioned country.

The species of this genus with which I am acquainted all ramble over the seas, both by night and by day, until the breeding season commences, when they remain in their burrows, under rocks, or in their fissures, until towards sunset, when they start off in search of food, returning to their mates or young in the morning, and feeding them then. I feel pretty confident that these birds, like Owls, can hold out against hunger for many hours, and are satisfied with one abundant meal in the day. WILSON was of a different opinion, but I believe he never found these birds breeding.

The Forked-tailed Petrel emits its notes night and day, and at not very long intervals, although it is less noisy than Wilson's Petrel. They resemble the syllables *pewr-wit, pewr-wit*. Its flight differs from that of the other two species, it being performed in broader wheelings, and with firmer flappings, in which respect it resembles that of the Night Hawk, *Chordeiles virginianus*, while that bird is passing low over the meadows or the waters. It is more shy than the other species, and when it wheels off after having approached the stern of a ship, its wanderings are much more extended before it returns. I have never seen it fly close around a vessel, as the others are in the habit of doing, especially at the approach of night; nor do I think that it ever alights on the rigging of ships, but spends the hours of

darkness either on the water, or on low rocks or islands. It also less frequently alights on the water, or pats it with its feet, probably on account of the shortness of its legs, although it frequently allows them to hang down. In this it resembles the *Thalassidroma pelagica*, and Wilson's Petrel has a similar habit during calm weather. I have seen all the three species immerse their head into the water, to seize their food, and sometimes keep it longer under than I had expected.

About the first of June, the species separate, collect in numbers, and return to their breeding places. I state so from the report of persons on whose testimony I can rely, and who have assured me that, like the Guillemots, they revisit their haunts each spring for years in succession. They now fly in front of the high rocks, in the manner of our Purple Martin when it first arrives at its well known box, passing and repassing a thousand times in the day, enter their dark and narrow mansions, or stand in the passage, and emit their cries, as the bird just mentioned is wont to do on similar occasions. Now they alight on some broad shelf, and walk as if about to fall down, but with considerable ease, and at times with rapidity. Now and then the mated birds approach each other, and, I believe, disgorge some food into each other's mouths, although I am not absolutely certain that they do so, having only observed them at such times by means of a glass. They collect grasses and pebbles, of which they form a flat nest, on which a single white egg is deposited, which measures an inch and a quarter in length, by seven-eighths in breadth, is nearly equally rounded at both ends, and looks very large for the size of the bird. When boiled, it has a musky smell, but is palatable. When you pass close to the rocks in which they are, you easily hear their shrill querulous notes; but the report of a gun silences them at once, and induces those on the ledges to betake themselves to their holes.

The Forked-tailed Petrel, like the other species, feeds chiefly on floating mollusca, small fishes, crustacea, which they pick up among the floating sea-weeds, and greasy substances, which they occasionally find around fishing-boats or ships out at sea. When seized in the hand, it ejects an oily fluid through the tubular nostrils, and sometimes disgorges a quantity of food. I could not prevail on any of those which I had caught to take food.

THALASSIDROMA LEACHII, Bonap. Syn., p. 367.
FORK-TAILED STORMY PETREL, *Thalassidroma Leachii*, Nutt. Man., vol. ii. p. 326.
FORKED-TAILED PETREL, *Thalassidroma Leachii*, Aud. Orn. Biog., vol. iii. p. 434.

Male, 8, 18½.

Common on the Banks of Newfoundland, and at times off the coast of

Massachusetts, Maine, and Nova Scotia. Breeds on the shores of Baffin's Bay.

Adult Male.

Bill shorter than the head, slender, straight, with the tips curved, as broad as high at the base, extremely compressed at the end. Upper mandible with the nostrils forming a tube on its ridge at the base, beyond which the dorsal line is for a short space straight, then decurved, the ridge narrow and separated from the convex sides by a narrow groove, the edges sharp, inflected, the tip compressed, incurved. Lower mandible with the angle rather long, narrow and pointed, the dorsal line beyond it decurved, the sides erect, the edges sharp, the tip decurved.

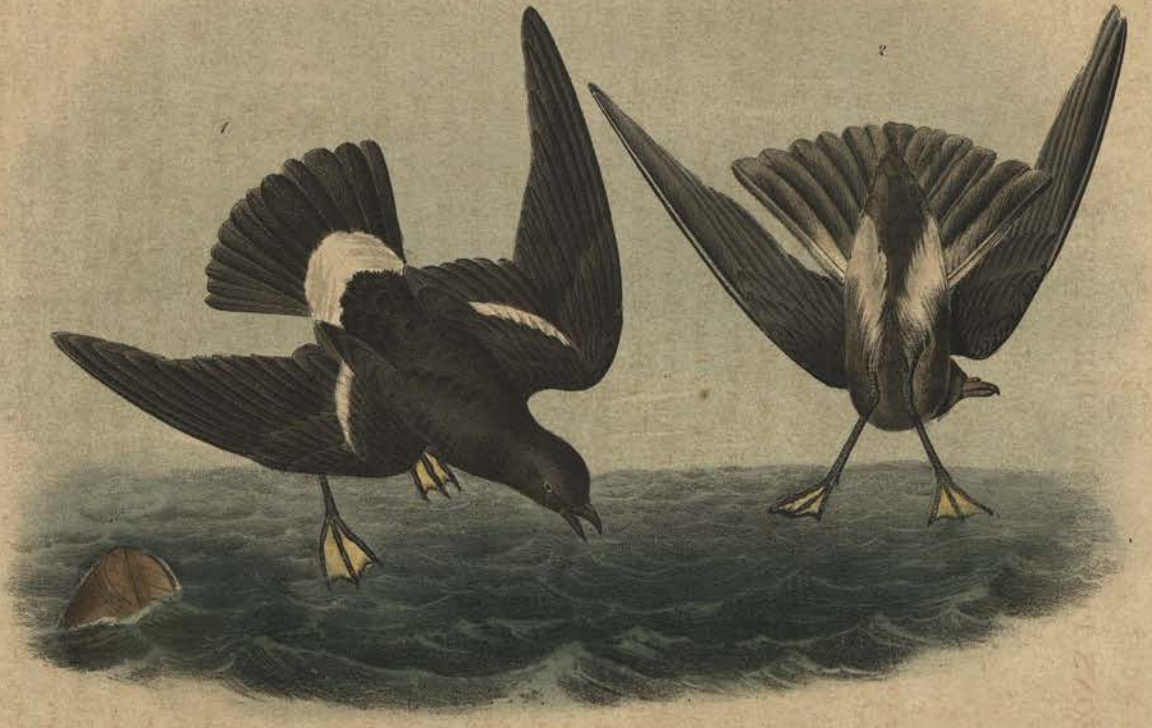
Head of ordinary size, roundish, anteriorly narrowed. Neck short. Body rather slender. Feet rather long, slender; tibia bare at its lower part; tarsus slender, reticulate all round. Hind toe minute, with a conical claw; anterior toes of moderate length, slender, scutellate above, connected by striated webs with concave margins; the third and fourth toes longest, and about equal. Claws slender, arched, compressed, acute.

Plumage very soft, blended, the feathers distinct only on the wings, which are very long; primary quills tapering but rounded, the outer four a little incurved at their extremities, the second longest, the third almost equal, the first and fourth about the same length, the rest rapidly graduated; outer secondaries incurved, obliquely rounded; inner longer, tapering, straight. Tail deeply forked, of twelve broad, rounded feathers.

Bill and feet black. Iris dark brown. The general colour of the plumage is dark greyish-brown, the quills and tail brownish-black, the smaller wing-coverts and inner secondaries light greyish-brown; the rump, sides of the abdomen, and exterior lower tail-coverts, white.

Length to end of tail 8 inches, to end of wings $8\frac{1}{2}$; extent of wings $18\frac{1}{2}$; wing from flexure $6\frac{1}{2}$; tail 3; bill along the back $\frac{8}{12}$, along the edge of lower mandible $\frac{6}{12}$; tarsus 1; middle toe $\frac{6}{12}$, its claw $\frac{3}{12}$. Weight $1\frac{5}{8}$ oz.

The Female is exactly similar to the male.



WEB

Wilson's Petrel. Mother Carey's chicken.

Drawn from Nature by J.J.Audubon F.R.S.F.L.S. 1 Male. 2 Female Lith.ª Printed & Col.ª by J. T. Bowen. Phila.ª

WILSON'S PETREL.—MOTHER CAREY'S CHICKEN.

THALASSIDROMA WILSONII, *Bonap.*

PLATE CCCCLX.—MALE AND FEMALE.

A long voyage would always be to me a continued source of suffering, were I restrained from gazing on the vast expanse of the waters, and on the ever-pleasing inhabitants of the air that now and then appear in the ship's wake. The slightest motion of the vessel effectually prevents me from enjoying the mirth of my fellow passengers, or sympathizing with them in their sickness. When the first glimpse of day appears, I make my way on deck, where I stand not unlike a newly hatched bird, tottering on feeble legs. Let the wind blow high or not, I care little which, provided it waft me toward the shores of America. If the sky be clear, the first sight of the sun excites emotions of gratitude towards the Being by whose power it was formed, and sent forth to shed its benign influence on surrounding worlds. Silent adoration occupies my soul, and I conclude with ardent wishes for the happiness of friends left far behind, and those toward whom I am proceeding. But now, ever flapping its winglets, I have marked the little bird, dusky all over save a single spot, the whiteness of which contrasts with the dark hue of the waters and the deep tone of the clear sky. Full of life and joy it moves to and fro, advances toward the ship, then shoots far away, gambols over the swelling waves, dives into their hollows, and twitters with delight as it perceives an object that will alleviate its hunger. Never fatigued, the tiny Petrels seldom alight, although at times their frail legs and feet seem to touch the crest of the foaming wave. I love to give every creature all the pleasure I can confer upon it, and towards the little things I cast over the stern such objects as I know they will most prize. Social creatures! would that all were as innocent as you! There are no bickerings, no jealousies among you; the first that comes is first served; it is all the result of chance; and thus you pass your lives. But the clouds gather, the gale approaches, and our gallant bark is trimmed. Darkness spreads over the heavens, and the deep waters send back a blacker gloom, broken at intervals by the glimmer of the spray. You meet the blast, and your little wings bear you up against it for awhile; but you cannot encounter the full force of the tempest; and now you have all come close beneath me, where

you glide over the curling eddies caused by the motion of the rudder. You shall have all possible attention paid you, and I will crawl to the camboose, in search of food to support your tiny frames in this hour of need. But at length, night closes around, and I bid you farewell.

The gale is over; the clear blue of the sky looks clearer than ever, the sun's rays are brighter, on the quiet waters the ship seems to settle in repose, and her wings, though widely spread, no longer swell with the breeze. At a distance around us the dusky wanderers are enjoying the bright morning; the rudder-fish, yesterday so lively, has ended its career, so violently was it beaten by the waves against the vessel; and now the Petrels gather around it, as it floats on the surface. Various other matters they find; here a small crab, there the fragments of a sea-plant. Low over the deep they range, and now with little steps run on the waters. Few are their notes, but great their pleasure, at this moment. It is needless for me to feed them now, and therefore I will return to my task.

It would be extremely difficult for any individual to determine the extent of the movements of the three species of Petrel seen on the waters of the Atlantic. My opinion is that until their breeding places are repeatedly visited by naturalists, little can be known respecting the range of their flight. I have crossed the ocean many times, and have always paid more or less attention to these birds; yet I am as ignorant of their migrations as my predecessors. I have rarely seen Wilson's Petrel farther to the eastward than the Azores, and beyond these islands it generally abandoned the vessel. Along the American coast, I have not met with it to the northward beyond the 51st degree of latitude; while to the southward I have rarely observed many on the Gulf of Mexico; nor do I believe that any breed on the shores of the Floridas, or on the Bahama Islands, as alleged by WILSON, who, it would appear, stated so from report. Petrels are rarely destroyed by men, quadrupeds, or rapacious birds, when breeding; to the former they are of no value as an article of food, and by the latter they are seldom sought after; consequently they are more likely to return to their breeding places than most other birds, many of which are frequently induced to abandon them on account of the persecutions to which they are subjected. I have found the Forked-tailed Petrel breeding on our coast, in the fissures of rocks above the reach of the spray, and Wilson's digging for itself burrows in the sand or loose earth, on low islands. The *Thalassidroma pelagica* I have never found breeding on any part of our coast; but it is well known that it resorts to holes on certain of the Shetland Islands, among the blocks and stones of which the breaches are formed; though it appears that in some spots, where the fishermen are in the habit of destroying them, many resort to the elevated fissures of the rocks, where also a few of the Forked-tailed species

occasionally breed. The latter then, though more abundant in America, belongs to Europe also. WILSON was not aware that the species now named after him was any thing else than "the Stormy Petrel, *Procellaria pelagica* of LINNÆUS;" and he remarks that it "is found over the whole Atlantic ocean, from Europe to North America, at all distances from land, and in all weathers."

Wilson's Petrel breeds on some small islands situated off the southern extremity of Nova Scotia, and called "Mud Islands," but which are formed of sand and light earth, scantily covered with grass. Thither the birds resort in great numbers, about the beginning of June, and form burrows of the depth of two or two and a half feet, in the bottom of which is laid a single white egg, a few bits of dry grass, scarcely deserving the name of a nest, having been placed for its reception. The egg measures an inch and a half in length, by seven-eighths of an inch in breadth, is almost equally rounded at both ends, and has a pure white colour. These Petrels copulate on the water, in the same manner as the Hyperborean Phalarope. By the beginning of August the young follow their parents to sea, and are then scarcely distinguishable from them. During incubation, they remain in the burrows, or at their entrance, rarely going to seek for food before the dusk.

On wing this species is more lively than the Forked-tailed, but less so than the Common Stormy Petrel. It keeps its wings nearly at right angles with its body, and makes considerable use of its feet, particularly during calm weather, when it at times hops or leaps for several feet, or pats the water, whilst its wings are extended upwards with a fluttering motion, and it inclines its head downwards to pick up its food from the water, and I have observed it immerse the whole head beneath the surface, to seize on small fishes, in which it generally succeeded. It can walk pretty well on the deck of a vessel, or any other flat surface, and rise from it without much difficulty. Its notes are different from those of the Forked-tailed Petrel, and resemble the syllables *kee-re-kee kee*. They are more frequently emitted at night than by day. I never could ascertain whether or not these birds alight on the rigging at night, but my opinion is that they do not, for the sailors, to whom I had offered premiums for catching some of them, told me that although they flew about them while aloft, they could not see one standing anywhere.

During my several visits to the coasts of the Floridas I saw scarcely any of these birds in the course of several months spent there, but I found them pretty abundant on returning towards Charleston. This species, like the others, feeds on mollusca, small fishes, crustacea, marine plants, excrements of cetaceous animals, and the greasy substances thrown from vessels. When

caught, they squirt an oily substance through the nostrils, and often disgorge the same. The sexes are similar in their external appearance.

STORMY PETREL, *Procellaria pelagica*, Wils. Amer. Orn., vol. vii. p. 90.
THALASSIDROMA WILSONII, Bonap. Syn., p. 367.
WILSON'S STORMY PETREL, Nutt. Man., vol. ii. p. 322.
WILSON'S PETREL, *Thalassidroma Wilsonii*, Aud. Orn. Biog., vol. iii. p. 486; vol. v. p. 645.

Male, 7¼, 15¾.

Wanders from the Gulf of Mexico, off the whole Atlantic coast to Baffin's Bay, and often almost across the ocean towards Europe. Breeds in vast numbers from Maine to Baffin's Bay.

Adult Male.

Bill shorter than the head, slender, straight, with the tips curved, as broad as high at the base, compressed towards the end. Upper mandible with the nostrils forming a tube at the base, beyond which, for a short space, the dorsal line is straight, then decurved, the ridge narrow and separated from the sides by a narrow groove, the edges sharp, inflected, the tip compressed, obliquely deflected. Lower mandible with the angle rather long, narrow and pointed, the dorsal line beyond it very slightly concave and decurved, the sides erect, the edges sharp, the tip slightly decurved.

Head of moderate size, roundish, anteriorly narrowed. Neck short. Body rather slender. Feet long, very slender; tibia bare at its lower part; tarsus very slender, reticulate, anteriorly with a long plate which is very slightly marked. Hind toe conical, so minute as scarcely to be perceptible; anterior toes rather long and extremely slender, obscurely scutellate above, connected by striated webs with concave margins; the third and fourth toes longest, and about equal. Claws slender, arched, depressed, acute.

Plumage very soft, blended, the feathers distinct only on the wings, which are very long; primary quills tapering, but rounded, the third longest, the second slightly longer than the fourth, the first much shorter and a little longer than the sixth; secondaries short, the outer incurved, obliquely rounded. Tail rather long, even, of twelve broad rounded feathers.

Bill and feet black, but the webs yellow excepting at the margin. Iris dark brown. The general colour of the plumage is dark greyish-brown, the quills and tail brownish-black, the outer secondary wing-coverts and some of the secondary quills light greyish-brown, and tipped with whitish. The rump, sides of the abdomen, and exterior lower tail-coverts, white.

Length to end of tail 7¼ inches, to end of wings 8, to end of claws 8; extent of wings 15¾; wing from flexure 6; tail 3¾; bill along the back $\frac{7}{12}$

along the edge of lower mandible $\frac{8}{12}$; tarsus $1\frac{5}{8}$; middle toe 1, its claw $\frac{3}{12}$. Weight $1\frac{1}{8}$ oz.

Adult Female.

The female resembles the male.

The palate is marked behind with four longitudinal ridges, which are papillate, and before with three ridges; the mouth $4\frac{1}{2}$ twelfths in width, but capable of being dilated to 9 twelfths; the tongue $\frac{1}{2}$ inch long, triangular and acuminate, at the base concave and emarginate, flat above, with a slight median groove. The lobes of the liver are equal, their length $7\frac{1}{2}$ twelfths. The œsophagus, *a b*, has a uniform width of 3 twelfths until it enters the thorax, when it at once expands into an immense ovate sac, *b c d e*, 1 inch 11 twelfths long, viewed anteriorly 1 inch 1 twelfth in breadth, laterally 1 inch 2 twelfths. This sac is formed, properly speaking, of the proventriculus; its walls are extremely thin and transparent, and it is studded all over with roundish glandules placed at a considerable distance from each other. It curves upwards in front, and becomes narrowed to 2 twelfths, ending in the stomach, which is an extremely diminutive gizzard, of an oval form, only $3\frac{1}{2}$ twelfths long, and 3 twelfths in breadth. The stomach is thus reversed in position, its fundus being anterior; and accordingly the intestine, *f g h i*, comes off from its left instead of its right side, forms a semicircular sweep round the fundus, then passes backward for 1 inch, to *f*, bends forward to the liver, at *g*, and forms a number of loops, *g h i*, making in all 9 turns. The duodenum is 1 inch $\frac{3}{4}$ twelfth wide, and the intestine continues so for half its length, when it gradually contracts to $\frac{3}{4}$ twelfth, and is rather less in the rectum, which is terminated by a very small globular cloaca, *j*, $3\frac{1}{2}$ twelfths in diameter. There are no cœca. The intestine measures 14 inches. The stomach properly so called is lined by a rugous epithelium, and is in fact a true gizzard. It contains a quantity of shell-sand. The inner surface of the proventriculus is soft and smooth; that of the œsophagus longitudinally plicate. The trachea is $1\frac{1}{2}$ inches long, from $1\frac{1}{2}$ twelfths to 1 twelfth in breadth, flattened, with rings 84 in number, slender, and unossified. Bronchi wide, of 25 half rings.

LEAST PETREL.—MOTHER CAREY'S CHICKEN.

THALASSIDROMA PELAGICA, *Linn.*

PLATE CCCCLXI.—MALE AND FEMALE.

In August, 1830, being becalmed on the banks of Newfoundland, I obtained several individuals of this species from a flock composed chiefly of *Thalassidroma Leachii*, and *Th. Wilsoni*. Their smaller size, and the more rapid motions of their wings, rendered them quite conspicuous, and suggested the idea of their being a new species, although a closer inspection shewed them to belong to the present. In their general manners, while feeding, floating on the water, or rambling round the boat in which I went in pursuit of them, they did not differ materially from the other species. Their flight, however, was more hurried and irregular, and none of them uttered any note or cry, even when wounded and captured. I have been assured that this bird breeds on the sandy beaches of Sable Island on the coast of Nova Scotia ; but not having had an opportunity of visiting it, or any other breeding place, I here present you with Mr. HEWITSON'S observations on this subject.

"In an excursion," says this amiable and enterprising naturalist, "through the Shetland Islands during the present summer, in search of rarities for this work, (the British Oology,) I had the very great satisfaction of seeing and taking many of these most interesting birds alive ; they breed in great numbers on several of the islands, principally upon Foula, the north of Hunst, and upon Papa, and Oxna, two small islands in the Bay of Scalloway ; the last of these I visited on the 31st of May in hopes of procuring their eggs (it being the season in which most of the sea-birds begin to lay) ; but in this I was disappointed ; the fishermen, who knew them well by the name of Swallows, assured me that my search would be quite useless, that they had not yet "come up from sea," and so it proved. Sixteen days after this (June 16th and three following days) I was at Foula, but was alike unsuccessful, the birds had arrived at their breeding places, but had not yet begun laying their eggs ; numbers of them were sitting in their holes, and were easily caught : one man brought me about a dozen tied up in an old stocking, two of which I kept alive in my room for nearly three days, and derived very great pleasure from their company ; during the day they were mostly inactive, and after pacing about the floor for a short time, poking their head

Least Petrel - Mother Carey's chicken?

Drawn from Nature by J.J.Audubon FRSFLS.

1. Male. 2. Female.

Lith.d Printed & Col.d by J. T. Bowen. Philad.a

into every hole, they hid themselves between the feet of the table and the wall; I could not prevail upon them to eat anything, though I tried to tempt them with fish and oil; their manner of walking is very light and pleasing, and differing from that of every other bird which I have seen; they carry their body so far forward and so nearly horizontal, as to give them the appearance of being out of equilibrium. In the evening, toward sun-set, they left their hiding-places, and for hours afterwards never ceased in their endeavours to regain their liberty; flying round and round the room, or fluttering against the windows; when flying, their length of wing, and white above the tail, gives them a good deal the appearance of our House-Martin. I went to bed and watched them in their noiseless flight, long ere I fell asleep, but in the morning they had disappeared; one had fortunately made its escape through a broken pane in the window which a towel should have occupied, the other had fallen into a basin, full of the yolks of eggs which I had been blowing, and was drowned. I regretted much the fate of a being so interesting, by its very remarkable, wandering, solitary, and harmless life. Before leaving Shetland I again visited the island of Oxna, and though so late as the 30th of June, they were only just beginning to lay their eggs. In Foula they breed in the holes in the cliff, at a great height above the sea; but here under stones which form the beach, at a depth of three or four feet, or more, according to that of the stones; as they go down to the earth, beneath them, on which to lay their eggs. In walking over the surface, I could hear them, very distinctly, singing in a sort of warbling chatter, a good deal like Swallows when fluttering above our chimneys, but harsher; and in this way, by listening attentively, was guided to their retreat, and after throwing out stones as large as I could lift on all sides of me, seldom failed in capturing two or three seated on their nests, either under the lowest stone or between two of them. The nests, though of much the same materials as the ground on which they were placed, seem to have been made with care; they were of small bits of stalks of plants, and pieces of hard dry earth. Like the rest of the genus, the Stormy Petrel lays invariably one egg only. During the day-time they remain within their holes; and though the fishermen are constantly passing over their heads, (the beach under which they breed being appropriated for the drying of fish,) they are then seldom heard, but toward night become extremely querulous; and when most other birds are gone to rest, issue forth in great numbers, spreading themselves far over the surface of the sea. The fishermen then meet them very numerously; and though they have not previously seen one, are sure to be surrounded by them upon throwing pieces of fish overboard."

The egg measures one inch and an eighth in length, six and a half eighths in breadth, is nearly equally rounded at both ends, rather thick-shelled, and

pure white, but generally with numerous minute dots of dull red at the larger end, sometimes forming a circular band.

STORMY PETREL, *Thalassidroma pelagica*, Nutt. Man., vol. ii. p. 327.
LEAST PETREL, *Thalassidroma pelagica*, Aud. Orn. Biog., vol. iv. p. 310.

Male, 5¾, 13½.

Not uncommon on the banks of Newfoundland. Not observed to breed on the American coast.

Adult Male.

Bill shorter than the head, slender, compressed towards the end, straight, with the tips curved. Upper mandible with the nostrils forming a tube at the base, beyond which, for a short space, the dorsal line is nearly straight, then suddenly decurved, the sides declinate, the edges sharp, the tip compressed and acute. Lower mandible with the angle rather long, narrow, and pointed, the dorsal line beyond it very slightly concave and decurved, the sides erect, the edges sharp, the tip slightly decurved.

Head of moderate size, roundish, anteriorly narrowed. Neck short. Body rather slender. Feet of moderate length, very slender; tibia bare at its lower part; tarsus very slender, reticulate; hind toe extremely minute, being reduced, as it were, to a slightly decurved claw; anterior toes rather long and extremely slender, obscurely scutellate above, connected by striated webs with concave margins. Claws slender, arched, compressed, acute.

Plumage very soft, blended, the feathers distinct only on the wings, which are very long and narrow; primary quills tapering, but rounded, the second longest, the first three and a half twelfths, the third a twelfth and a half shorter; secondaries short, the outer incurved, obliquely rounded. Tail rather long, broad, slightly rounded, of twelve broad rounded feathers.

Bill and feet black. Iris dark brown. The general colour of the upper parts is greyish-black, with a tinge of brown, and moderately glossed; the lower parts of a sooty-brown; the secondary coverts margined externally with dull greyish-white; the feathers of the rump and the upper tail-coverts white, with the shafts black, the tail-coverts broadly tipped with black.

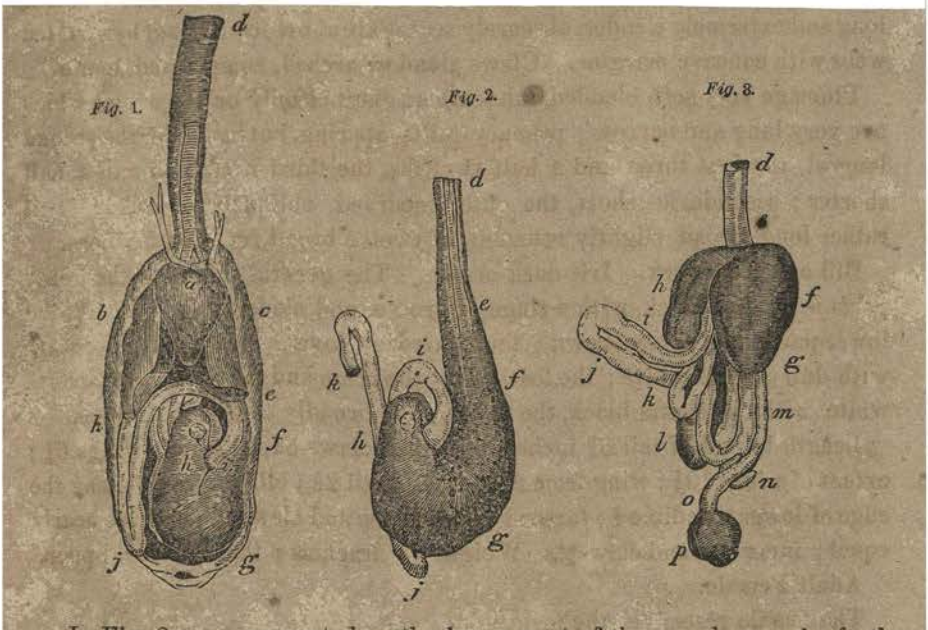
Length to end of tail 5¾ inches, to end of claws 5¼, to end of wings 6¼; extent of wings 13½; wing from flexure 5⅛; tail 2⅛; bill above ⅝; along the edge of lower mandible ⅝; tarsus ⅞; middle toe and claw ⅞; outer toe nearly equal; inner toe and claw ⅝. Weight 4½ drachms; the individual poor.

Adult Female.

The female resembles the male.

A male bird, from Nova Scotia, examined. The upper mandible internally has a longitudinal median ridge; the palate is convex, with two lateral

ridges. The tongue is 5½ twelfths long, emarginate and serrulate at the base, very much flattened, tapering to a horny point. The heart, Fig. 1, *a*, is of a very elongated narrow conical form, 2 twelfths in length, 4 twelfths in breadth at the base. The lobes of the liver, *b c*, are equal, 6½ twelfths long. The œsophagus, *d e*, is 1 inch 10 twelfths long, of a uniform diameter of 2½ twelfths; behind the liver, it enters as it were a large sac, *f g h*, 9 twelfths of an inch long, which gradually expands to a diameter of 6 twelfths, forming a broad rounded fundus *g*, then curves forwards on the right side, and at *h* terminates in a small gizzard, about 3 twelfths long, and nearly of the same breadth, from the left side of which comes off the intestine. The latter passes forward, curving to the right, behind and in contact with the posterior surfaces of the liver, then forms the duodenal fold, *h j k*, in the usual manner. The intestine, on arriving at the right lobe of the liver, at *k*, receives the biliary duct, curves backward beneath the kidneys, and forms several convolutions, which terminate above the proventriculus. It then becomes much narrower, and passes directly backward, in a straight course to the rectum, which is only 4 twelfths of an inch long. The cœca are oblong, 1¼ twelfths in length, and ½ twelfth in diameter. The intestine is 8½ inches long, its diameter diminishing gradually from 2 twelfths to ¾ of a twelfth.



In Fig. 2 are represented :—the lower part of the œsophagus, *d e f*; the proventricular sac, *f g h*; the very small gizzard, *h*; the duodenal fold of the intestine, *i j k*. Here the parts are viewed from the left side.

Fig. 3 represents:—the proventricular sac thrust forward, *f g h*; the gizzard, *h*; the duodenum, *i j k*, pulled to the right side; the convolutions of the intestine, *l m*, under the kidneys; the cœca, *n*; the rectum, *o*; and the cloaca, *p*.

The proventricular glands are very numerous, but not so closely placed as is usual, although scattered over a much larger extent, from *e* to *g*, in Fig. 2. Between the termination of the glands and the stomach there is a portion destitute of glandules. The stomach or gizzard has its muscular coat thick, its tendons moderate, its inner surface covered with a rather thick but not very hard epithelium, which is more prolonged on two opposite sides, although in the fundus it is complete.

This curious digestive apparatus agrees very nearly with that described and figured by Sir EVERARD HOME as that of *Alca Alle*. The stomach, it is seen, is excessively large in proportion to the size of the bird; but why it should be so, and moreover be curved in this manner, is not very obvious. Conjectures are easily made, and might run in this form. This little bird, which wanders over the face of the ocean, subsisting upon garbage, oily and fatty substances, small fishes, and even sea-weeds, requires a large stomach for the reception of its heterogeneous fare, which not being always very nutritious or easily digestible, must be very plentifully intermixed with the gastric juices, and detained a considerable time; which conditions are accordingly provided for by the very great number and extensive dispersion of the proventricular glandules, and the curve of the organ. Should any hard substances, as crustacea, be introduced, they are pounded by the gizzard; but as the bird is little addicted to feeding on such substances, that organ is reduced to a very small size.

The aperture of the glottis is 1½ twelfths long. The trachea is 1 inch 7 twelfths in length, wide, flattened, its diameter from 2 twelfths to 1½ twelfths; its rings unossified, 82 in number. The bronchi are short, wide, of about 12 half rings.

FAMILY XLIV.—ALCINÆ. AUKS.

Bill not longer than the head, much compressed, generally very high, in the species approaching the next family rather slender. Nostrils small, linear, basal, and sub-marginal. Head large, broadly ovate, anteriorly narrowed; neck short and thick; body full, compact, ovate, or somewhat elongated. Feet short, rather stout, placed far behind; tibia bare for a short space; tarsus very short, compressed, anteriorly scutellate; toes three, of moderate length, scutellate, webbed. Claws strong, arched, acute. Plumage dense, blended, soft. Wings small, narrow, pointed. Tail very short. Tongue slender, trigonal; œsophagus very wide, within the thorax extremely dilated; stomach rather large, muscular, with the epithelium dense and longitudinally rugous; intestine long and wide; cœca of moderate size. Trachea simple, with a single pair of inferior laryngeal muscles. Egg generally single.

Genus I.—MORMON, *Illiger*. PUFFIN.

Bill about the length of the head, nearly as high as long, exceedingly compressed, at the base as high as the head, obliquely furrowed on the sides; upper mandible with a horny dotted rim along the basal margin; its dorsal line decurved from the base, the ridge narrow, at the base rounded, the sides rapidly sloped, with three or four curved oblique grooves, the edges sharp, their outline nearly straight, the tip deflected, very narrow, but obtuse; lower mandible with the angle very narrow, and so placed that the base of the bill is inflected beyond the perpendicular, the dorsal line a little convex at first, towards the end ascending, and nearly straight, the sides perpendicular, the edges sharp; the tip very narrow, obliquely truncate; gap-line extending downwards a little beyond the base of the bill, and furnished with a soft corrugated extensile membrane. Nostrils marginal, linear, direct, in the horny part of the bill. Head large, roundish-ovate; neck short and thick; body full and rounded. Feet short, rather stout, placed far behind,

tibia bare for a short space; tarsus very short, little compressed, anteriorly with a series of small scutella; toes three, connected by entire webs, the outer and middle toes nearly equal. Claws strong, of moderate length, arched, acute, that of the inner toe much curved. Plumage close, blended, soft. Wings short, narrow, curved, acute; the first quill longest; secondaries short and rounded. Tail very short, slightly rounded, of sixteen feathers.

THE TUFTED PUFFIN.

MORMON CIRRHATUS, *Lath.*

PLATE CCCCLXII.—MALE.

The specimen from which I drew the figure of this singular looking bird, was procured at the mouth of the Kennebec river in Maine. It was shot by a fisherman-gunner, while standing on some floating ice, in the winter of 1831–32. No other individual was seen. I could not obtain any information respecting its habits; but as the bird was in tolerable order, I hope that my figures of it will prove not unacceptable. It was a male, and appeared to be adult. My friend the Prince of MUSIGNANO, mentions this species as being an inhabitant of the seas between North America and Kamtschatka, being, he adds, often found on the western coasts of the United States in winter.

ALCA CIRRHATA, Lath. Ind. Orn., vol. ii. p. 791.
MORMON CIRRHATUS, Bonap. Syn., p. 429.
TUFTED MORMON or PUFFIN, Nutt. Man., vol. ii. p. 539.
TUFTED PUFFIN, *Mormon Cirrhatus*, Aud. Orn. Biog., vol. iii. p. 364.

Male, 15, 22½.

Extremely rare and accidental on the coast of the United States in winter. Common in the Arctic Seas, and on the north-west coast of America.

Adult Male.

Bill about the length of the head, nearly as high as long, extremely compressed, at the base as high as the head, furrowed on the sides. Upper mandible with a horny rim along the basal margin, its dorsal line convex to the

Tufted Puffin.

1. Male. 2. Female.

Drawn from Nature by J.J. Audubon F.R.S.L.S.

Lith.ª Printed & Col.ª by J.T. Bowen. Philad.ª

middle, or along the extent of a long, narrow, rounded dorsal prominence, which extends from the base to the first groove, afterwards curved in the fourth of a circle, the ridge narrow, in its basal half rounded, narrower and rather sharp towards the end, the sides slightly convex, and marked with four curved transverse grooves, between the nostril and the tip, the edges rather blunt, nearly straight, until close to the decurved, narrow, obtuse tip. The basal rim is scrobiculate, the rest of the mandible smooth. The nostrils are linear, direct, close to the edge, and near the base. Lower mandible with the angle extremely short and narrow, the dorsal line nearly straight and ascending, the sides slightly concave, without grooves, the ridge narrow but convex, the tip very narrow, obliquely truncate. The gap extends downwards a little beyond the base of the bill, and is furnished with a soft corrugated extensible membrane.

Head large, oblong, anteriorly compressed; eye of moderate size, with the edges of the eyelids bare; neck short and thick; body full and rounded. Feet short, rather stout; tibia bare for a short space above the joint; tarsus very short, anteriorly with a series of small scutella, the rest with small roundish scales. Hind toe wanting; toes of moderate length, rather slender, scutellate above, connected by reticulated entire membranes, the third toe longest, the fourth a little shorter, the second considerably shorter, with a narrow marginal web. Claws strong, of moderate length, compressed, arched, that of the inner toe much curved, of the middle toe with a thin inner edge.

Plumage close, blended, soft, very short on the head, where, however, along a line over and behind the eye, there is on each side a tuft of long, very slender, acute incurved feathers, of a shining hair-like texture. Wings rather short, curved, narrow, acute; primary quills narrow, incurved, first longest, second slightly shorter, the rest rapidly graduated; secondaries very short, small and rounded. Tail very short, slightly rounded, of sixteen narrow, rounded, decurved feathers.

Bill light yellowish-red, the basal rim and the ridge towards the end of the upper mandible bright red, as is the edge of the eyelids. Iris light blue. Feet bright red; webs of a deeper tint; claws black. Sides of the head white; upper part brownish-black; the elongated feathers behind the eye pale yellow. The general colour of the upper parts is brownish-black, glossed with blue, of the lower deep purplish-brown.

Length to end of tail 15 inches, to end of wings 14, to end of claws 14; extent of wings 22½; wing from flexure 8$\frac{5}{12}$; tail 2¼; bill along the ridge 2$\frac{3}{4}$, along the edge of lower mandible 1$\frac{11}{12}$; tarsus 1$\frac{5}{12}$; middle toe 1$\frac{13}{12}$; its claw $\frac{7}{12}$.

THE LARGE-BILLED PUFFIN.

MORMON GLACIALIS, *Leach.*

PLATE CCCCLXIII.—MALE.

Although my learned friend Prince CHARLES BONAPARTE says in his Synopsis of the Birds of the United States, that this species is not uncommon in winter on our coast, I have only once met with it, and even then I rather supposed than was actually certain that the birds observed were Large-billed Puffins. They occurred on the outer side of the Island of Grand Manan, at the entrance of the Bay of Fundy. None were seen by myself or my companions on our way to Labrador, or in that country, so that I am unable to say anything respecting the habits of this remarkable bird. The specimens from which my figures were taken were kindly lent to me by Mr. GOULD of London, whose name must be familiar to you as a successful cultivator of Ornithology.

MORMON GLACIALIS, Bonap. Syn., p. 430.
LARGE-BILLED PUFFIN, Nutt. Man., vol. ii. p. 541.
LARGE-BILLED PUFFIN, *Mormon glacialis*, Aud. Orn. Biog., vol. iii. p. 599.

Male, 13, 24½.
Very rare, and in winter only, off the Bay of Fundy.
Adult Male.

Bill about the length of the head, nearly as high as long, exceedingly compressed, at the base higher than the head, obliquely furrowed on the sides. Upper mandible with a horny rim along the incurved basal margin, its dorsal line irregularly curved from the base, the ridge very narrow but rounded, the sides rapidly sloping, and marked with three curved oblique grooves, the edges strong, rather sharp, their outline nearly straight, the tip deflected, very narrow, but obtuse. Between the basal rim and the first groove is a triangular flat space, in the lower part of which, close to the edge of the mandible, is the linear direct nostril. Lower mandible with the angle narrow, and so placed that the base is inflected much beyond the perpendicular, the dorsal line irregularly curved, towards the end ascending and nearly straight, the ridge narrow, broader about the middle, the sides

Large billed Puffin.

1. Male 2. Female.

Drawn from Nature by J.J.Audubon,F.R.S.F.L.S. Lith.d Printed & Col.d by J. T. Bowen, Phila.a

nearly flat and grooved, the edges strong, the tip very narrow. The gap extends downwards a little beyond the base of the bill, and is furnished with a soft corrugated extensible membrane.

Head large, oblong, anteriorly compressed. Eyes of moderate size, with bare orbits; over the upper eyelid an oblong, tapering, horny body directed upwards and backwards, on the lower a linear body of a similar nature over its whole length. Neck short and thick. Body full and rounded. Feet short, rather stout; tibia bare for a short space above the joint. Tarsus very short, little compressed, anteriorly for three-fourths of its length with a series of small scutella, the rest with reticular angular scales. Hind toe wanting, toes rather long and slender, scutellate above, connected by reticulated entire membranes, the third and fourth toes about equal, the second considerably shorter, with a narrow marginal web. Claws strong, of moderate length, compressed, arched, that of the inner toe much curved and acute.

Plumage close, blended, soft, very short on the head. Wings curved, short, narrow, acute. Primary quills tapering, incurved, the first longest, the second a little shorter, the rest regularly graduated; secondaries very short and rounded. Tail very short, much rounded, of sixteen rounded feathers.

Bill bright orange-red, soft edges of mouth gamboge. Edges of eyelids orange-red; the iris and horny appendages light blue. Feet orange-red, with the webs paler, the claws yellowish-brown. The sides of the head and the lower parts in general, white; upper part of the head light brownish-grey tinged with lilac; a broad collar extending to the lower mandible, of a dark greyish-brown tint below, and gradually passing into the colour of the upper parts, which is brownish-black, glossed with blue; primary quills and their coverts blackish-brown, very slightly margined with paler.

Length to end of tail 13 inches, to end of claws 14, to end of wings 12½; extent of wings 24½; bill along the ridge 2¼, along the edge of lower mandible 1⅝; depth of bill at the base 1 1/16, its greatest diameter ⅝; tarsus 1⅜; middle toe 1⅝, its claw ½.

Adult Female.

The female is precisely similar to the male.

COMMON OR ARCTIC PUFFIN.

MORMON ARCTICUS, *Linn.*

PLATE CCCCLIV.—MALE AND FEMALE.

The Sea Parrot, as this bird is usually called on the eastern coasts of the United States, as well as by the fishermen of Newfoundland and Labrador, sometimes proceeds as far south as the entrance of the river Savannah in Georgia, where I saw a good number of them in the winter of 1831–32. It is by no means, however, common with this species to extend its southward migrations so far, and I suspect it does so only in very severe weather. It is never plentiful off Long Island, but becomes more abundant the farther you proceed eastward, until you reach the entrance to the Bay of Fundy, where it is quite common, and on the islands of which many breed, although not one perhaps now for a hundred that bred there twenty years ago. Those which proceed farther north leave the United States about the middle of April, and move along the coast, none ever crossing over the land to any extent. On my voyage to Labrador I observed Puffins every day; but although we reached that country in the early part of June, none had then begun to breed. As we approached the shores of that inhospitable land, we every now and then saw them around the vessel, now floating on the swelling wave, now disappearing under the bow, diving with the swiftness of thought, and sometimes rising on wing and flying swiftly, but low, over the sea. The nearer we approached the coast the more abundant did we find the Puffins, and sometimes they were so numerous as actually to cover the water to the extent of half an acre or more. At first we paid little attention to them, but as soon as I became aware that they had begun to breed, I commenced an investigation, of which I now proceed to lay before you the result.

The first breeding place which I and my party visited was a small island, a few acres in extent, and pleasant to the eye, on account of the thick growth of green grass with which it was covered. The shores were exceedingly rugged, the sea ran high, and it required all the good management of our captain to effect a safe landing, which, however, was at length accomplished at a propitious moment, when, borne on the summit of a great wave, we reached the first rocks, leaped out in an instant, and held our boat, while

Common or Arctic Puffin.

1. Male 2. Female.

Drawn from Nature by J.J. Audubon F.R.S. F.L.S.

Lith.ª Printed & Col.ª by J. T. Bowen. Philad.ª

the angry waters rolled back and left it on the land. After securing the boat, we reached with a few steps the green sward, and directly before us found abundance of Puffins. Some already alarmed flew past us with the speed of an arrow, others stood erect at the entrance of their burrows, while some more timid withdrew within their holes as we advanced towards them. In the course of half an hour we obtained a good number. The poor things seemed not at all aware of the effect of guns, for they would fly straight towards us as often as in any other direction ; but after awhile they became more knowing, and avoided us with more care. We procured some eggs, and as no young ones were yet to be found, we went off satisfied. The soil was so light, and so easily dug, that many of the burrows extended to the depth of five or six feet, although not more than a few inches below the surface, and some of the poor birds underwent a temporary imprisonment in consequence of the ground giving way under our weight. The whole island was perforated like a rabbit-warren, and every hole had its entrance placed due south, a circumstance which allowed the birds to emerge in our sight almost all at once, presenting a spectacle highly gratifying to us all. Our visit to this island took place on the 28th of June, 1833.

On the 12th of August, our Captain, my friends GEORGE SHATTUCK and WILLIAM INGALLS, with four sailors, and another boat in company, went on a visit to "Perroket Island," distant about two miles from the harbour of Bras d'Or. The place is known to all the cod-fishers, and is celebrated for the number of Puffins that annually breed there. As we rowed towards it, although we found the water literally covered with thousands of these birds, the number that flew over and around the green island seemed much greater, insomuch that one might have imagined half the Puffins in the world had assembled there. This far-famed isle is of considerable extent, its shores are guarded by numberless blocks of rock, and within a few yards of it the water is several fathoms in depth. The ground rises in the form of an amphitheatre to the height of about seventy feet, the greatest length being from north to south, and its southern extremity fronting the Strait of Belleisle. For every burrow in the island previously visited by us there seemed to be a hundred here, on every crag or stone stood a Puffin, at the entrance of each hole another, and yet the sea was covered and the air filled by them. I had two double-barrelled guns and two sailors to assist me ; and I shot for one hour by my watch, always firing at a single bird on wing. How many Puffins I killed in that time I take the liberty of leaving you to guess.

The burrows were all inhabited by young birds, of different ages and sizes, and clouds of Puffins flew over our heads, each individual holding a "lint" by the head. This fish, which measures four or five inches in length,

and is of a very slender form, with a beautiful silvery hue, existed in vast shoals in the deep water around the island. The speed with which the birds flew made the fish incline by the side of their neck. While flying the Puffins emitted a loud croaking noise, but they never dropped the fish, and many of them, when brought down by a shot, still held their prey fast. I observed with concern the extraordinary affection manifested by these birds towards each other; for whenever one fell dead or wounded on the water, its mate or a stranger immediately alighted by its side, swam around it, pushed it with its bill as if to urge it to fly or dive, and seldom would leave it until an oar was raised to knock it on the head, when at last, aware of the danger, it would plunge below in an instant. Those which fell wounded immediately ran with speed to some hole, and dived into it, on which no further effort was made to secure them. Those which happened to be caught alive in the hand bit most severely, and scratched with their claws at such a rate that we were glad to let them escape. The burrows here communicated in various ways with each other, so that the whole island was perforated as if by a multitude of subterranean labyrinths, over which one could not run without the risk of falling at almost every step. The voices of the young sounded beneath our feet like voices from the grave, and the stench was extremely disagreeable, so that as soon as our boats were filled with birds we were glad to get away.

During the whole of our visit, the birds never left the place, but constantly attended to their avocations. Here one would rise from beneath our feet, there, within a few yards of us, another would alight with a fish, and dive into its burrow, or feed the young that stood waiting at the entrance. The young birds were far from being friendly towards each other, and those which we carried with us kept continually fighting so long as we kept them alive. They used their yet extremely small and slender bills with great courage and pertinacity, and their cries resembled the wailings of young whelps. The smaller individuals were fed by the parents by regurgitation, or received little pieces of fish which were placed in their mouths; the larger picked up the fish that were dropped before them; but almost all of them seemed to crawl to the entrance of the holes for the purpose of being fed. In all the burrows that communicated with others, a round place was scooped out on one side of the avenue, in the form of an oven; while in those which were single, this oven-like place was found at the end, and was larger than the corridor. All the passages were flattish above, and rounded beneath, as well as on the sides. In many instances we found two birds sitting each on its egg in the same hole.

The Puffin never lays more than one egg, unless the first may have been destroyed or taken away; nor does it raise more than a single young one in

the season. The time of incubation is probably from twenty-five to twenty-eight days, although I have not been able to ascertain the precise period. Both birds work in digging the hole, using their bills and feet; they also sit alternately on their egg, although the female engages more industriously in this occupation, while the male labours harder at the burrow. The egg is pure white when first deposited, but soon becomes soiled by the earth, as no nest is formed for its reception. It generally measures two and a half inches by one and three-fourths, but varies in size according to the age of the bird, as well as in shape, some being considerably more rounded at the smaller end than others. When boiled, the white is of a livid-blue colour. The captain and myself were the only persons of our party who tried to eat some. The eggs are certainly very bad, and are never collected by "The Eggers." The flesh of the birds is very dark, tough, and so fishy as to be eatable only in cases of great want. Two Italians who had come to Labrador to purchase cod-fish, and were short of provisions, fed upon Puffins daily, to the great amusement of our party. The fishermen at times, when bait is scarce along the coast, destroy a great number of these birds, which they skin like rabbits, and then cut the flesh into slices.

The flight of the Puffin is firm, generally direct, now and then pretty well sustained. It is able to rise at once from the water or the land, although at times it runs on both before taking to wing. This depends much on necessity, for if pushed it flies at once from the ground, or plunges under the surface of the water. There they swim, with the wings partially opened, at a small depth, passing along in the manner of Divers; and by this means they catch their prey; but at other times they dive to the bottom, many fathoms deep, for shell-fish and other objects.

During the love season, the males chase each other in the air, on the water, or beneath its surface, with so much quickness, as to resemble the ricochets of a cannon-ball. Having kept several for about a week, I threw them overboard in the harbour where we were at anchor, and where the water was beautifully clear. On leaving my gloved hand, they plunged through the air, entered the water, and swam off, assisting themselves by their wings, to the distance of from fifty to a hundred yards. On coming up, they washed their plumage for a long time, and then dived in search of food. While on board, they ran about from the dark towards the light, keeping themselves erect, and moving with great briskness, until at times close to my feet, when they would watch my motions like Hawks, and if I happened to look towards them, would instantly make for some hiding-place. They fed freely and were agreeable pets, only that they emitted an unpleasant grunting noise, and ran about incessantly during the night, when each footstep could be counted. When on rocky shores, or islands with

large stones, I observed that the Puffins often flew from one crag or stone to another, alighting with ease, and then standing erect.

The young, while yet covered with down, are black, with a white patch on the belly. Their bills do not acquire much of the form which they ultimately have for several weeks ; nor do they assume their perfect shape for years. I have examined many hundred individuals, among which I have found great differences in the size and form of the bill. In fact, the existence of this diversity has induced many persons to think that we have several species of Puffin on our coasts ; but, after having examined many specimens in Europe, I am decidedly of opinion that this species is the same that occurs in both continents, and that we have only one more at all common on our eastern coasts. The sexes differ in no perceptible degree, only that the males are somewhat larger. When two years old they may be considered of their full size, although the bill continues to grow and acquires furrows, until it becomes as you see it in the plate.

MORMON ARCTICUS, Bonap. Syn., p. 430.
PUFFIN or COULTERNEB, Nutt. Man., vol. ii. p. 542.
PUFFIN, *Mormon arcticus*, Aud. Orn. Biog., vol. iii. p. 105.

Male 11¾, 23.

Ranges southward along the coast in winter, at times as far as Georgia. Less rare from Long Island eastward, and becomes plentiful in the Bay of Fundy. Breeds in vast numbers in burrows, on the islands off Labrador.

Adult Male in summer.

Bill about the length of the head, nearly as high as long, exceedingly compressed, at the base as high as the head, obliquely furrowed on the sides. Upper mandible with a horny rim along the basal margin, its dorsal line curved from the base, the ridge very narrow but rounded, the sides rapidly sloped, and marked with three curved oblique grooves, the edges obtuse, their outline nearly straight, the tip deflected, very narrow but obtuse. Between the basal rim and the first groove is a triangular flat space analogous to the nasal groove, in the lower part of which, close to the edge of the bill, is the linear direct nostril. Lower mandible with the angle very narrow, and so placed that the base of the bill is inflected beyond the perpendicular, the dorsal line a little convex at first, towards the end straight, the ridge narrow, broader about the middle, the sides nearly flat, grooved and ridged as in the upper, the edges strong, the tip very narrow. The gap extends downwards a little beyond the base of the bill, and is furnished with a soft corrugated extensible membrane.

Head large, oblong, anteriorly compressed. Eye rather small, with bare

orbits; over the upper eyelid an oblong, nearly erect, horny body, along the lower a more elongated one of the same nature. Neck short and thick, body full and rounded. Wings short. Feet short, rather stout; tibia bare for a short way above the joint. Tarsus very short, little compressed, anteriorly with a series of small scutella, the rest with reticular angular scales. Hind toe wanting. Toes of moderate length, rather slender, scutellate above, connected by reticulated entire membranes which project a little, the third and fourth toes about equal, the second considerably shorter, with a narrow marginal web. Claws strong, of moderate length, compressed, slightly arched; that of the inner toe much curved and acute.

Plumage close, blended, soft, very short on the head. Wings curved, short, narrow, acute. Primary quills narrow, incurved, first longest, second a little shorter, the rest rapidly graduated. Secondaries very short, small and rounded. Tail very short, slightly rounded, of sixteen narrow rounded feathers.

Bill with the basal rim and first ridge of upper mandible dull yellow, the intervening space greyish-blue, basal margin of lower bright red, first ridge and intervening space as in the upper, the rest bright red (carmine tinged with vermilion); membrane at the base of the gap gamboge-yellow, inside of mouth and tongue yellow. Edge of eyelids vermilion, horny appendages of eyelids greyish-blue. Iris light blue. Feet vermilion, claws black. Throat and sides of the head white, that colour extending over the eye, and passing in a narrow line behind the occiput. Upper part of the head blackish-grey, tinged with olive, paler anteriorly. The middle of the neck all round, and all the upper parts of the body, deep black, with blue reflections, the quills tinged with brown. The whole under surface white, except the upper part of the sides, which are dusky.

Length to end of tail 11¾ inches, to end of claws 13½, extent of wings 23; bill along the back 2, along the edge of upper mandible 1¼; depth of bill at base 1⅝, its greatest diameter ⅝; tarsus 1, middle toe 1½, its claw ½. Weight ¾ lb.

Female.

The female is precisely similar to the male, but of somewhat smaller size.

Genus II.—ALCA, *Linn.* AUK.

Bill as long as the head, feathered as far as the nostrils, beyond which it is very high, exceedingly compressed, and obliquely furrowed on the sides; upper mandible with the dorsal line decurved, the ridge extremely narrow, the sides nearly flat, the nasal groove very large, and feathered, with its lower margin very narrow, and convex, the edges sharp and inflected, the tip decurved, very narrow, but obtuse; lower mandible with the angle very narrow, and having a horny triangular appendage, the sides at first extremely narrow, towards the end erect and flat, the edges inflected, the dorsal outline concave, the tip decurved. Nostrils medial marginal, linear, short, concealed by the feathers. Head large, ovate; neck short and thick; body full, rather depressed. Feet placed far behind, short, stout; tibia bare for a short space; tarsus very short, compressed, anteriorly scutellate; hind toe wanting; anterior toes of moderate length, rather slender, scutellate, webbed, the outer slightly longer than the middle. Claws rather small, arched, compressed, obtuse. Plumage close, blended, very soft. Wings very short, narrow, acute, first quill longest. Tail short, tapering, of twelve or fourteen feathers.

Great Auk

Drawn from Nature by J.J. Audubon, FRSFLS

Lith.d Printed & Col.d by J. T. Bowen. Phila.a

GREAT AUK.

ALCA IMPENNIS, *Linn.*

PLATE CCCCLXV.—ADULT.

The only authentic account of the occurrence of this bird on our coast that I possess, was obtained from Mr. HENRY HAVELL, brother of my Engraver, who, when on his passage from New York to England, hooked a Great Auk on the banks of Newfoundland, in extremely boisterous weather. On being hauled on board, it was left at liberty on the deck. It walked very awkwardly, often tumbling over, bit every one within reach of its powerful bill, and refused food of all kinds. After continuing several days on board, it was restored to its proper element.

When I was in Labrador, many of the fishermen assured me that the "Penguin," as they name this bird, breeds on a low rocky island to the south-east of Newfoundland, where they destroy great numbers of the young for bait; but as this intelligence came to me when the season was too far advanced, I had no opportunity of ascertaining its accuracy. In Newfoundland, however, I received similar information from several individuals. An old gunner residing on Chelsea Beach, near Boston, told me that he well remembered the time when the Penguins were plentiful about Nahant and some other islands in the bay.

The egg is very large, measuring five inches in length, and three in its greatest breadth. In form it resembles that of the Common Guillemot; the shell is thick and rather rough to the touch; its colour yellowish-white, with long irregular lines and blotches of brownish-black, more numerous at the larger end.

GREAT AUK, *Alca impennis*, Nutt. Man., vol. ii. p. 553.
GREAT AUK, *Alca impennis*, Aud. Orn. Biog., vol. iv. p. 316.

Adult, 29, 27¼

Rare and accidental on the banks of Newfoundland; said to breed on a rock near that island.

Adult in summer.

Bill as long as the head, feathered as far as the nostrils, beyond which it is

very high, exceedingly compressed, tapering, and slightly declinate. Upper mandible with the dorsal line straight for an inch and a quarter, then declinate and decurvate to the end, the ridge very narrow, broader at the base; the sides nearly flat, with a basal ridge succeeded by a deep groove, then a large flat space, succeeded by eight oblique curved ridges, the edges sharp toward the end, the tip decurved and obtuse. Nostrils marginal, linear, short, pervious, but concealed by the feathers. Lower mandible with the angle long, the sides extremely narrow and linear for half their length, the horny part not being extended over the bone, which is covered with feathers, afterwards deep and compressed, with the dorsal line at first convex, then ascending and concave to the end, the sides flat, with about ten transverse ridges, the edges sharp, the tip deflected.

Head large, oblong, anteriorly narrowed. Eyes rather small. Neck short and thick. Body compact and full. Wings extremely small, but perfectly formed. Feet placed far behind, short, very strong; tarsus short, compressed, anteriorly scutellate, laterally covered with angular scales, those on the hind part very small. Hind toe wanting; third toe longest, outer nearly as long, inner much shorter, lateral toes marginate, all with numerous scutella and several rows of angular scales above, and connected by reticulated webs. Claws rather small, narrow, arched, convex above, and obtuse.

Plumage close, blended, very soft, on the head and neck short and velvety. Wings diminutive, much pointed; the primaries tapering to an acute point, the first longest, the rest rapidly graduated, their coverts long; secondaries short and broad, scarcely longer than their coverts. Tail short, pointed, of *fourteen* feathers.

Bill black, with the grooves between the transverse ridges white. Iris hazel. Feet and claws black. Fore part of the neck below, and all the lower parts white, of which colour also is a large oblong patch before each eye and the tips of the secondary quills, the rest black; the throat and sides of the neck tinged with chocolate-brown, the wings with greyish-brown, the head, hind neck, and back glossed with olive-green.

Length to end of tail 29 inches, to end of wings 23¾, to end of claws 31½, to carpal joint 18½; extent of wings 27¼; wing from flexure 7⅛; tail 2⅞; bill along the ridge 3⅝, along the edge of lower mandible 4½; greatest depth of upper mandible 1, depth of lower ⅝; width of gap 1⅞; tarsus 2; middle toe 2⅝, its claw ⅝; outer toe 2⅝, its claw ⅜; inner toe 2⅛, its claw ⅛.

Drawn from Nature by J.J.Audubon FRSELS

Razor billed Auk

1 Male 2 Female

Lith.d Printed & Col.d by J. T. Bowen, Phila.a

THE RAZOR-BILLED AUK.

ALCA TORDA, *Linn.*

PLATE CCCCLXVI.—MALE AND FEMALE.

A few birds of this species occasionally go as far south as New York during winter ; but beyond that parallel I never met with one. From Boston eastward many are seen, and some breed on the Seal Islands off the entrance of the Bay of Fundy. These Auks generally arrive on our Atlantic coast about the beginning of November, and return northward to breed about the middle of April. During their stay with us, they are generally seen singly, and at a greater distance from the shores than the Guillemots or Puffins ; and I have no doubt that they are able to procure shell-fish at greater depths than these birds. I have observed them fishing on banks where the bottom was fifteen or eighteen fathoms from the surface, and, from the length of time that they remained under water, felt no doubt that they dived to it. On my voyage round Nova Scotia and across the Gulf of St. Lawrence, we saw some of them constantly. Some had eggs on the Magdeleine Islands, where, as the inhabitants informed us, these birds arrive about the middle of April, when the Gulf is still covered with ice. As we proceeded towards Labrador, they passed us every now and then in long files, flying at the height of a few yards from the water, in a rather undulating manner, with a constant beat of the wings, often within a musket-shot of our vessel, and sometimes moving round us and coming so close as to induce us to believe that they had a wish to alight. The thermometer indicated 44°. The sight of these files of birds passing swiftly by was extremely pleasing ; each bird would alternately turn towards us the pure white of its lower parts, and again the jetty black of the upper. As I expected ere many days should pass to have the gratification of inspecting their breeding-grounds, I experienced great delight in observing them as they sped their flight toward the north.

After we had landed, we every day procured Auks, notwithstanding their shyness, which exceeded that of almost all the other sea-birds. The fishermen having given me an account of their principal breeding places, the Ripley proceeded toward them apace. One fair afternoon we came in view of the renowned Harbour of Whapati Guan, and already saw its curious

beacon, which being in form like a huge mounted cannon placed on the elevated crest of a great rock, produced a most striking effect. We knew that the harbour was within the stupendous wall of rock before us, but our pilot, either from fear or want of knowledge, refused to guide us to it, and our captain, leaving the vessel in charge of the mate, was obliged to go off in a boat, to see if he could find a passage. He was absent more than an hour. The Ripley stood off and on, the yards were manned on the look-out, the sea was smooth and its waters as clear as crystal, but the swell rose to a prodigious height as it passed sluggishly over the great rocks that seemed to line the shallows over which we floated. We were under no apprehension of personal danger, however, for we had several boats and a very efficient crew; and besides, the shores were within cannon shot; but the idea of losing our gallant bark and all our materials on so dismal a coast haunted my mind, and at times those of my companions. From the tops our sailors called out "Quite shallow here, sir." Up went the helm, and round swung the Ripley like a duck taken by surprise. Then suddenly near another shoal we passed, and were careful to keep a sharp look-out until our commander came up.

Springing upon the deck, and turning his quid rapidly from side to side, he called out, "All hands square the yards," and whispered to me, "All's safe, my good sir." The schooner advanced towards the huge barrier, merrily as a fair maiden to meet her beloved; now she doubles a sharp cape, forces her way through a narrow pass; and lo! before you opens the noble harbour of Whapati Guan. All around was calm and solemn; the waters were smooth as glass, the sails fell against the masts, but the impetus which the vessel had received urged her along. The lead was heaved at every yard, and in a few minutes the anchor was dropped.

Reader, I wish you had been there, that you might yourself describe the wild scene that presented itself to our admiring gaze. We were separated from the rolling swell of the Gulf of St. Lawrence by an immense wall of rock. Far away toward the east and north, rugged mounds innumerable rose one above another. Multitudes of frightened Cormorants croaked loudly as they passed us in the air, and at a distance flew divers Guillemots and Auks. The mossy beds around us shone with a brilliant verdure, the Lark piped its sweet notes on high, and thousands of young codfish leaped along the surface of the deep cove as if with joy. Such a harbour I had never seen before; such another, it is probable, I may never see again; the noblest fleet that ever ploughed the ocean might anchor in it in safety. To augment our pleasures, our captain some days after piloted the Gulnare into it. But, you will say, "Where are the Auks, we have lost sight of them

entirely." Never fear, good reader, we are in a delightful harbour, and anon you shall hear of them.

Winding up the basin toward the north-east, Captain Emery, myself, and some sailors, all well armed, proceeded one day along the high and precipitous shores to a distance of about four miles, and at last reached the desired spot. We landed on a small rugged island. Our men were provided with long poles, having hooks at their extremities. These sticks were introduced into the deep and narrow fissures, from which we carefully drew the birds and eggs. One place, in particular, was full of birds; it was an horizontal fissure, about two feet in height, and thirty or forty yards in depth. We crawled slowly into it, and as the birds affrighted flew hurriedly past us by hundreds, many of their eggs were smashed. The farther we advanced, the more dismal did the cries of the birds sound in our ears. Many of them despairing of effecting their escape, crept into the surrounding recesses. Having collected as many of them and their eggs as we could, we returned, and glad were we once more to breathe the fresh air. No sooner were we out than the cracks of the sailors' guns echoed among the rocks. Rare fun to the tars, in fact, was every such trip, and, when we joined them, they had a pile of Auks on the rocks near them. The birds flew directly towards the muzzles of the guns, as readily as in any other course, and therefore it needed little dexterity to shoot them.

When the Auks deposit their eggs along with the Guillemots, which they sometimes do, they drop them in spots from which the water can escape without injuring them; but when they breed in deep fissures, which is more frequently the case, many of them lie close together, and the eggs are deposited on small beds of pebbles or broken stones raised a couple of inches or more to let the water pass beneath them. Call this instinct if you will:—I really do not much care; but you must permit me to admire the wonderful arrangements of that Nature from which they have received so much useful knowledge. When they lay their eggs in such an horizontal cavern as that which I have mentioned above, you find them scattered at the distance of a few inches from each other; and there, as well as in the fissures, they sit flat upon them like Ducks, for example, whereas on an exposed rock each bird stands almost upright upon its egg. Another thing quite as curious, which I observed, is that while in exposed situations the Auk seldom lays more than one egg, yet in places of greater security I have in many instances found two under a single bird. This may perhaps astonish you, but I really cannot help it.

The Razor-billed Auks begin to drop their eggs in the beginning of May. In July we found numerous young ones, although yet small. Their bill then scarcely exhibited the form which it ultimately assumes. They were

covered with down, had a lisping note, but fed freely on shrimps and small bits of fish, the food with which their parents supply them. They were very friendly towards each other, differing greatly in this respect from the young Puffins, which were continually quarrelling. They stood almost upright. Whenever a finger was placed within their reach, they instantly seized it, and already evinced the desire to bite severely so cordially manifested by the old birds of this species, which in fact will hang to your hand until choked rather than let go their hold. The latter when wounded threw themselves on their back, in the manner of Hawks, and scratched fiercely with their claws. They walked and ran on the rocks with considerable ease and celerity, taking to wing, however, as soon as possible. When thus disturbed while breeding, they fly round the spot many times before they alight again. Sometimes a whole flock will alight on the water at some distance, to watch your departure, before they will venture to return.

This bird lays one or two eggs, according to the nature of the place. The eggs measure at an average three inches and one-eighth, by two and one-eighth, and are generally pure white greatly blotched with dark reddish-brown or black, the spots generally forming a circle towards the larger end. They differ considerably from those of the Common and the Thick-billed Guillemots, being less blunted at the smaller end. The eggs afford excellent eating; the yolk is of a pale orange colour, the white pale blue. The eggers collect but few of the eggs of this bird, they being more difficult to be obtained than those of the Guillemot, of which they take vast numbers every season.

The food of the Razor-billed Auk consists of shrimps, various other marine animals, and small fishes, as well as roe. Their flesh is by the fishers considered good, and I found it tolerable, when well stewed, although it is dark and therefore not prepossessing. The birds are two years in acquiring the full size and form of their bill, and, when full grown, they weighed about a pound and a half. The stomach is an oblong sac, the lower part of which is rather muscular, and answers the purpose of a gizzard. In many I found scales, remnants of fish, and pieces of shells. The intestines were upwards of three feet in length.

Immediately after the breeding season, these birds drop their quills, and are quite unable to fly until the beginning of October, when they all leave their breeding-grounds for the sea, and move southward. The young at this period scarcely show the white streak between the bill and the eye; their cheeks, like those of the old birds at this time, and the fore part of the neck, are dingy white, and remain so until the following spring, when the only difference between the young and the old is, that the former have the bill

smaller and less furrowed, and the head more brown. The back, tail, and lower parts do not seem to undergo any material change

ALCA TORDA, Bonap. Syn., p. 431.
RAZOR-BILL, *Alca Torda*, Nutt. Man., vol. ii. p. 547.
RAZOR-BILLED AUK, *Alca Torda*, Aud. Orn. Biog., vol. iii. p. 112; vol. v. p. 628.

Male, 17, 29½.

Rare on the eastern coast of the United States, and only during winter. Breeds in great numbers on the Gannet Rock in the Gulf of St. Lawrence, on the shores of Newfoundland, and the western coast of Labrador, chiefly in the fissures of rocks.

Adult Male in summer.

Bill shorter than the head, feathered as far as the nostrils, beyond which it is very high, exceedingly compressed, and obliquely furrowed on the sides. Upper mandible with the dorsal line curved so as to form the third of a circle, the ridge extremely narrow but rounded, the sides nearly flat, with five grooves, the one next the base deeper and more narrow, the edges inflected and sharp, the tip decurved and obtuse. Nostrils medial, marginal, linear, short, pervious, but concealed by the feathers. Lower mandible with the angle very narrow, and having a horny triangular appendage, the base at first horizontal and extremely narrow, then sloping forwards and rounded, the dorsal outline rounded, towards the end concave, the sides slightly concave, the edges inflected, the tip decurved.

Head large, oblong, anteriorly narrowed. Eyes small. Neck short and strong. Body full, rather depressed. Wings small. Feet placed far behind, short, rather strong; tibia bare a short way above the joint; tarsus very short, compressed, anteriorly scutellate, laterally covered with reticulated angular scales, posteriorly granulate. Hind toe wanting; toes of moderate length, rather slender, scutellate above, connected by reticulated entire membranes, the inner toe having also a projecting margin; outer toe slightly longer than middle one; inner considerably shorter. Claws rather small, arched, compressed, obtuse.

Plumage close, blended, very soft, on the head very short and velvety. Wings short, curved, narrow, acute. Primary quills narrow, incurved, acute, first longest, second slightly shorter, the rest rapidly graduated; secondary quills very short, obliquely rounded. Tail short, tapering, of twelve narrow, pointed feathers.

Bill black, with a white line across each mandible; inside of the mouth gamboge-yellow. Iris deep hazel. Feet black. Fore part of neck below, and all the lower parts, white; the rest black, the head, hind neck, and back

glossed with olive-green, the throat and sides of the neck tinged with chocolate, the wings with brown, the tips of the secondary quills, and a narrow line from the bill to the eye, white.

Length to the end of tail 17 inches, to the end of claws 17¾; extent of wings 29½; wing from flexure 8¾; tail 4; bill along the ridge $1\frac{7}{12}$, along the edge $2\frac{2}{12}$, its greatest depth $\frac{11}{12}$; tarsus $1\frac{2}{12}$; middle toe $1\frac{3}{12}$, its claw $\frac{5}{12}$. Weight 1½ pounds.

Adult Female in summer.

The female is precisely similar to the male.

The Young in their winter plumage have the colouring distributed as in the old birds, but with the black duller, the wings more brown, the throat and sides of the head mottled with white, the white line from the bill to the eye existing, but the bill much smaller, without furrows or a white line.

The Old Birds in winter have the throat and sides of the neck mottled as described above; but in other respects their colours are the same as in summer.

The gullet wide, dilated towards the lower extremity, its mucous coat longitudinally corrugated; the proventriculus very wide and glandular; the stomach rather small, oblong, muscular, with an inner, longitudinally corrugated and horny cuticular coat. Pylorus very small; intestine near its commencement $\frac{1}{12}$ of an inch in diameter, gradually contracted to the cœca, where it is $\frac{2}{12}$; cœca half an inch long, tapering. The length of the gullet and stomach together is 8, that of the intestines 41 inches.

On the palate are several series of reversed papillæ, and two longitudinal papillate ridges; on its anterior part are five prominent lines; the posterior aperture of the nares linear, 1 inch in length; width of mouth 11 twelfths. Tongue 1¼ inches long, fleshy, slender in its whole length, trigonal, flat above, with a median groove, and tapering to a very thin horny point. Œsophagus 8½ inches long, its width along the neck 10 twelfths, but within the thorax it forms an enormous sac 3½ inches long, 1 inch 11 twelfths in breadth; the proventricular glands very numerous, forming a complete belt 3¼ inches in length, and occupying almost the whole of the sac above mentioned. Stomach very small, 10 twelfths long, 9 twelfths in breadth; its muscular coat thin, the tendons round, and about 5 twelfths in breadth; the epithelium thin, dense, and longitudinally rugous. Intestine 53 inches long, its average width 5 twelfths; the cœca 9 twelfths long, 1½ twelfths in breadth, 2 inches 1 twelfth distant from the extremity; cloaca globular, and about 1 inch in diameter.

Trachea 5 inches long, from 4½ twelfths to 3 twelfths in width, a little flattened; its rings 95, unossified. Bronchi very wide, of 18 half rings. Cleido-tracheal muscles, lateral muscles, sterno-tracheal slips, and a single pair of inferior laryngeal muscles.

Curled-crested Phaleris.

Adult.

Drawn from Nature by J.J. Audubon, F.R.S.F.L.S.

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Genus III.—PHALERIS, *Temm.* PHALERIS.

Bill shorter than the head, stout, straightish, broad at the base, compressed toward the end; upper mandible with a prominent basal rim as in the Puffin, its dorsal line convex and declinate, the sides sloping, the edges sharp, with a deep sinus close to the narrow, declinate, blunt tip; lower mandible with the angle rather long and wide, the dorsal line ascending and a little convex, the sides sloping outwards, the edges sharp, the tip ascending, obliquely truncate. Nostrils linear-oblong, direct, near the margin, in the horny part of the bill. Head rather large, ovate; neck short and thick; body full and compact. Feet short, placed far behind; tibia bare below; tarsus very short, much compressed, anteriorly scutellate; toes three, connected by emarginate webs; middle and outer toes of the same length. Claws rather stout, moderately arched, compressed, rather obtuse. Plumage dense, blended, soft. Wings of moderate length, very narrow, pointed. Tail very short, rounded, of fourteen feathers.

CURLED-CRESTED PHALERIS.

Phaleris cristatella, *Gmel.*

PLATE CCCCLXVII.—Adult.

My drawing of this singular bird, which belongs to the north-west coast, was taken from a specimen in the Museum of the Zoological Society. Since then I procured one for description, from Mr. Leadbeater.

Alca cristatella, Gmel. Syst. Nat., vol. i. p. 552.

Curled-crested Phaleris, *Phaleris cristatella*, Aud. Orn. Biog., vol. v. p. 102.

Adult, 10, wing, $6\frac{3}{4}$.

North-west coast of America.

Bill shorter than the head, stout, straightish, broad at the base, compressed toward the end. Upper mandible with a prominent basal rim as in the Puffins, its dorsal outline convex and declinate, the sides sloping, a prominent line descending from the base of the ridge to the anterior part of the nostril, which is linear-oblong, and near the margin, besides which there are several faint grooves; at the base is a somewhat triangular horny plate detached from the rest of the mandible, of which latter the margin is very convex behind the nostrils, then ascends, forms a slight festoon before them, and finally a deep sinus behind the decurved, narrow, but rather obtuse tip. Lower mandible with the angle rather long and wide, the dorsal line ascending and a little convex, the sides sloping outwards, a ridge passing obliquely from behind the angle to near the tip, the edge sinuate in correspondence with that of the upper, the tip *truncate*.

Body full and compact; neck short and thick; head rather large, ovate. Feet short, placed far behind; tibia bare for a quarter of an inch; tarsus very short, much compressed, anteriorly with small oblique scutella, the rest reticulate; hind toe wanting; anterior toes scutellate, connected by emarginate webs; the inner toe much shorter than the outer, which is of the same length as the middle, claws rather stout, moderately arched, compressed, rather obtuse; on the anterior part of the forehead is a tuft of about twenty linear recurved feathers, of which the longest measures $2\frac{1}{2}$ inches.

Plumage dense, blended, glossy. Wings of moderate length, narrow, pointed; primaries incurved, tapering, the first longest, the rest rapidly graduated; secondaries rounded. Tail very short, rounded, of fourteen rounded feathers.

Bill orange; feet greyish-blue. The general colour of the upper parts is brownish-black, of the lower deep purplish-grey. There is a short line of elongated linear acuminate white feathers, commencing under the eye, and proceeding along the side of the neck.

Length to end of tail 10 inches; bill along the ridge $\frac{7}{12}$, along the edge of lower mandible 1; wing from flexure $6\frac{9}{12}$; tail $1\frac{7}{12}$; tarsus $1\frac{1}{12}$; inner toe $\frac{11}{12}$, its claw $\frac{3}{12}$; middle toe $1\frac{4}{12}$, its claw $\frac{4}{12}$; outer toe $1\frac{7}{12}$, its claw $\frac{3}{12}$.

Knobbed-billed Phaleris.

Adults.

Drawn from Nature by J.J. Audubon F.R.S.F.L.S.

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KNOBBED-BILLED PHALERIS.

PHALERIS NODIROSTRIS, *Bonap.*

PLATE CCCCLXVIII.—ADULT.

This bird, which at first sight bears a considerable resemblance to the Little Guillemot, *Mergulus Alle*, I have also represented from a specimen belonging to the Zoological Society of London. The following description, however, is taken from one in my own possession. The species is said to occur on the north-west coast.

KNOBBED-BILLED PHALERIS, *Phaleris nodirostris*, Bonap., Aud. Orn. Biog. vol. v. p. 101.

Adult, 6, wing, 4.
North-west coast of America.
Adult.

Bill shorter than the head, stout, quadrangular at the base; upper mandible with a roundish, compressed, decurvate knob on its ridge, between the nostrils, beyond which the outline is deflected and convex, the sides sloping, the edges sharp and overlapping, with a sinus behind the small rather obtuse tip; nostrils linear-oblong, operculate, basal, near the margin; lower mandible with the angle rather long, the dorsal ascending and slightly convex, the sides sloping outwards and flat, the edges directed outwards, thin, the tip *acute*, with a slight sinus behind.

Body full and compact; neck short and thick; head rather large, ovate. Feet short, stout, placed far behind; tibia bare for two-twelfths of an inch; tarsus very short, compressed, covered anteriorly with oblique scutella; hind toe wanting; anterior toes united by emarginate webs; the inner toe considerably shorter than the outer, which is nearly as long as the middle. Claws rather small, moderately arched, compressed, rather acute.

Plumage dense, blended, glossy above. Wings of moderate length, narrow, pointed; primaries tapering, the first longest, the rest rapidly graduated; secondaries rounded. Tail very short, rounded, of fourteen feathers.

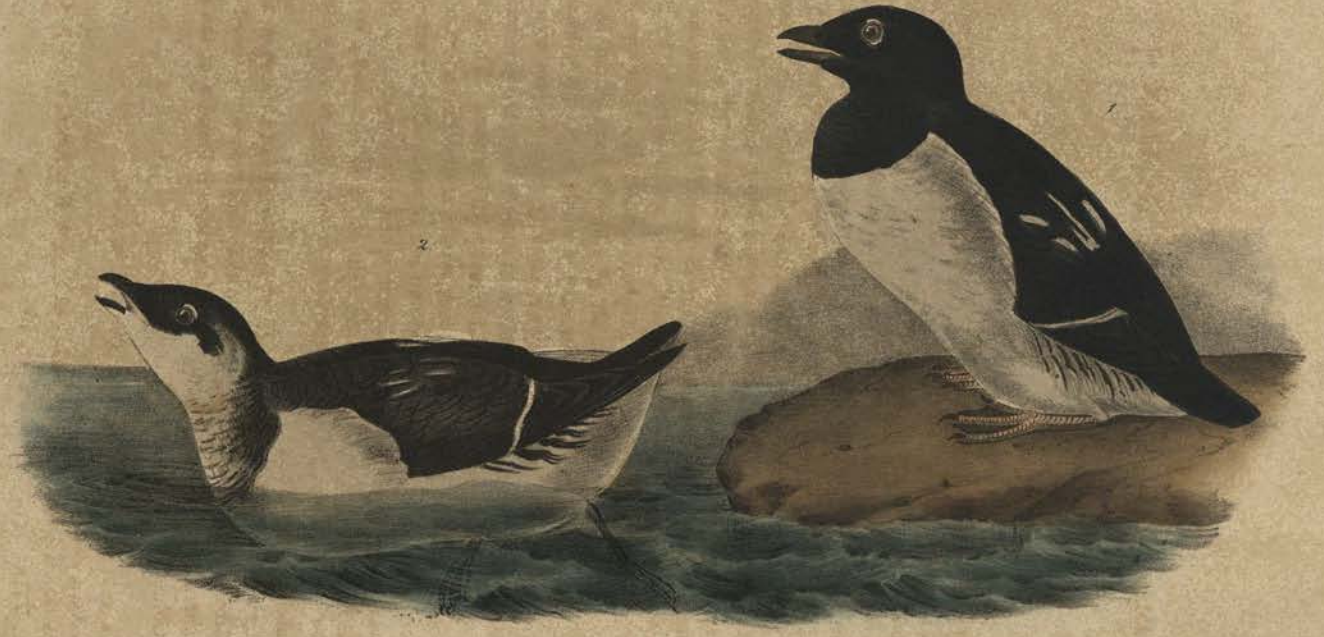
Bill orange-red, with its base, including the knob, greyish-blue; feet dusky-grey, claws brownish-black. The general colour of the upper parts

is brownish-black; the fore part and sides of the head streaked with linear, acuminate, elongated, white feathers; the tips of the secondaries also white. The cheeks and a small portion of the throat at the base of the bill are dusky; the lower parts white, mottled with dusky, the tips of the feathers being of that colour.

Length to end of tail 6 inches; bill along the ridge $\frac{}{1\,2}$, excluding the outline of the knob, which is $\frac{1}{1}\frac{1}{2}$ in height, and about the same length, along the edge of lower mandible $\frac{7}{1\,2}$; wing from flexure 4; tail $1\frac{1}{4}$; tarsus $\frac{9}{1\,2}$; inner toe $\frac{7}{1\,2}$, its claw $\frac{}{1\,2}$; middle toe $\frac{1}{1}\frac{0}{2}$, its claw $\frac{3}{1}\frac{1}{2}$; outer toe $\frac{1}{1}\frac{0}{2}$, its claw $\frac{2}{1\,2}$.

Genus IV.—MERGULUS, *Ray*. SEA-DOVE.

Bill shorter than the head, stout, nearly straight, sub-pentagonal at the base, compressed towards the end; upper mandible with the dorsal line convexo-declinate, the ridge convex, the sides sloping, the edges sharp and overlapping, the tip rather obtuse, nasal depression short and broad; nostrils basal, oblong; lower mandible with the angle long and wide, the dorsal line ascending, straight, the sides convex, toward the end ascending and flattened, the edges sharp and inclinate, the tip acute, with a sinus behind. Head large, ovate; neck short and thick; body full and compact. Feet short, rather stout; tibia bare for a very short space; tarsus very short, compressed, anteriorly covered with oblique scutella; hind toe wanting; anterior toes connected by entire webs, the third and fourth nearly equal. Claws rather small, moderately arched, compressed, rather acute. Plumage dense, glossy, blended. Wings of moderate length, narrow, pointed; the first quill longest, secondaries rounded. Tail very short, slightly rounded, of twelve feathers.



Little Auk. Sea dove.

1. Male. 2. Female.

Drawn from Nature by J.J.Audubon, F.R.S.F.L.S.

Lith.ᵈ Printed & Col.ᵈ by J. T. Bowen, Philad.ᵃ

COMMON SEA-DOVE.—LITTLE GUILLEMOT.

MERGULUS ALLE, *Linn.*

PLATE CCCCLXIX.—MALE AND FEMALE.

This interesting little bird sometimes makes its appearance on our eastern coasts during very cold and stormy weather. It does not proceed much farther southward than the shores of New Jersey, where it is of very rare occurrence. Now and then some are caught in a state of exhaustion, as I have known to be the case especially in Passamaquody Bay near Eastport in Maine, and in the vicinity of Boston and Salem in Massachusetts.

In the course of my voyages across the Atlantic, I have often observed the Little Guillemots in small groups, rising and flying to short distances at the approach of the ship, or diving close to the bow and reappearing a little way behind. Now with expanded wings they would flutter and run as it were on the surface of the deep; again, they would seem to be busily engaged in procuring food, which consisted apparently of shrimps, other crustacea, and particles of sea-weeds, all of which I have found in their stomach. I have often thought how easy it would be to catch these tiny wanderers of the ocean with nets thrown expertly from the bow of a boat, for they manifest very little apprehension of danger from the proximity of one, insomuch that I have seen several killed with the oars. Those which were caught alive and placed on the deck, would at first rest a few minutes with their bodies flat, then rise upright and run about briskly, or attempt to fly off, which they sometimes accomplished, when they happened to go in a straight course the whole length of the ship so as to rise easily over the bulwarks. On effecting their escape they would alight on the water and immediately disappear.

During my visit to Labrador and Newfoundland I met with none of these birds, although the codfishers assured me that they frequently breed there. I am informed by Mr. TOWNSEND that this species is found near the mouth of the Columbia river.

LITTLE AUK, *Alca Alle*, Wils. Amer. Orn., vol. ix. p. 94.

URIA ALLE, Bonap. Syn., p. 425.

LITTLE GUILLEMOT, *Uria Alle*, Swains. and Rich. F. Bor. Amer., vol. ii. p. 479.

Little Auk or Sea-dove, Nutt. Man., vol. ii. p. 531.
Little Guillemot, *Uria Alle*, Aud. Orn. Biog., vol. iv. p. 304.

Male, 7⅛, 14¼.

Rare and only during winter along the coast of the United States, from New York to Maine. More abundant along the coast of Nova Scotia, and far at sea. Breeds on the Arctic coasts.

Adult Male in summer.

Bill shorter than the head, stout, straightish, sub-pentagonal at the base, compressed towards the end. Upper mandible with the dorsal line convexo-declinate, the ridge convex, the sides sloping, the edges sharp and overlapping, the tip rather obtuse. Nasal depression short and broad; nostrils basal, oblong, with a horny operculum. Lower mandible with the angle long and wide, the dorsal outline very short, ascending and straight, the sides convex, toward the end ascending and flattened, the edges thin and inclinate, the tip acute, with a sinus behind.

Body full and compact; neck short and thick; head large, ovate. Feet short, rather stout; tibia bare for two-twelfths of an inch; tarsus very short, compressed, covered anteriorly with oblique scutella, behind with angular scales; hind toe wanting; anterior toes connected by reticulated webs, the inner much shorter than the outer, which is almost as long as the middle; the scutella numerous. Claws rather small, moderately arched, compressed, rather acute, that of the middle toe having its inner edge considerably expanded.

Plumage dense, blended, glossy. Wings of moderate length, narrow, pointed; primaries pointed, the first longest, the rest rapidly graduated; secondaries rounded. Tail very short, slightly rounded, of twelve feathers.

Bill black. Iris dark hazel. Feet pale flesh-coloured; webs dusky; claws black. Inside of mouth light yellow. The head, upper part of neck, and all the upper surface, glossy bluish-black. A small spot on the upper eyelid, another on the lower, several longitudinal streaks on the scapulars, and a bar along the tips of the secondary quills, white. The lower parts white; the feathers on the sides under the wings have the outer webs white, the inner dusky; lower wing-coverts blackish-grey.

Length to end of tail 7⅛ inches, to end of claws 7⅞, to end of wings 6⅞, to carpal joint 2⅞; extent of wings 14¼; wing from flexure 4⅜; bill along the ridge ⅝, along the edge of lower mandible 1; tarsus ⅝; middle toe 1; its claw ¼; outer toe 1, claw ⅛; inner toe ⅝, its claw ⅛. Weight 8½ oz.

Adult Female in winter.

In winter, the throat and the lower parts of the cheeks are white; the

sides and fore part of the neck white, irregularly barred with blackish-grey; the upper parts of a duller black than in summer.

There is nothing very remarkable in the anatomy of this bird, beyond what is observed in the Auks and Guillemots. The ribs extend very far back, and, having the dorsal and sternal portions much elongated, are capable of aiding in giving much enlargement to the body, of which the internal, or thoracic and abdominal cells are very large. The sub-cutaneous cells are also largely developed, as in many other diving and plunging birds.

The roof of the mouth is flat, broad, and covered with numerous series of short horny papillæ directed backwards. The tongue is large, fleshy, 10 twelfths of an inch long, emarginate at the base, flat above, horny on the back. The heart is large, measuring 10 twelfths in length, 8½ twelfths in breadth. The right lobe of the liver is $1\frac{3}{12}$ inches in length, the left $1\frac{1}{12}$; the gall-bladder is elliptical. The kidneys are very large.

The œsophagus, Fig. 1, *a b c*, is 3 inches 10 twelfths long, its walls very

Fig 1.

Fig. 2.

Fig. 3.

thin, its inner or mucous coat thrown into longitudinal plates; its diameter at the middle of the neck 5 eighths, diminishing to 4 twelfths as it enters the thorax. It then enlarges and forms the proventriculus, *e e*, which has a diameter of 8 twelfths; the glandules are cylindrical, very numerous, and arranged in a complete belt, half an inch in breadth, in the usual manner, as seen in Fig. 2, *b c*. The stomach, properly so called, Fig. 1, *d g*, is oblong, 11 twelfths in length, 8 twelfths in breadth; its muscular coat moderately thick, and disposed into two lateral muscles with large tendons; its epithelium, Fig. 2, *c d e*, thick, hard, with numerous longitudinal and transverse rugæ, and of a dark reddish-colour. The duodenum, *f g h*, curves in the usual manner at the distance of 1¼ inches, ascends towards the upper surface of the right lobe of the liver for 1 inch and 10 twelfths, then forms 4 loops, and from above the proventriculus passes directly backwards. The length of the intestine, *f g h i*, is 16½ inches, its diameter 2¼ twelfths, and nearly uniform as far as the rectum, which is 1¼ inches long, at first 3 twelfths in diameter, enlarged into an ovate cloaca of great size, Fig. 3, *b*; the cœca *a a*, 4½ twelfths long, cylindrical, ½ twelfth in diameter, obtuse.

The trachea, Fig. 1, *k l*, is very wide, flattened, its rings unossified, its length 2$\frac{9}{12}$ inches, its breadth 3 twelfths, nearly uniform, but at the lower part contracted to 2 twelfths. There are 75 rings, with 5 inferior blended rings, which are divided before and behind. The bronchi, Fig. 1, *m m*, are wide and rather elongated, with about 25 half rings. The contractor muscles are extremely thin, the sterno-tracheal slender; there is a pair of inferior laryngeal attached to the first bronchial rings.

The above account of the digestive organs of this bird will be seen to be very different from that given by Sir Everard Home, who has, in all probability, mistaken the species. "There is still," says he, "one more variety in the structure of the digestive organs of birds, that live principally upon animal food, which has come under my observation; and with an account of which I shall conclude the present lecture. This bird is the Alca Alle of Linnæus, the Little Auk. The termination of the œsophagus is only known by the ending of the cuticular lining, and the beginning of the gastric glands; for the cardiac cavity is one continued tube, extending considerably lower down in the cavity of the abdomen, and gradually enlarging at the lower part: it then turns up to the right side, about halfway to the origin of the cavity, and is there connected to a small gizzard, the digastric muscle of which is strong, and a small portion of the internal surface on each side has a hard cuticular covering. The gastric glands at the upper part are placed in four distinct longitudinal rows, becoming more and more numerous towards the lower part of the cavity, and extend to the bottom, where it turns up. The extent of the cavity in which the gastric

glands are placed, exceeds anything met with in the other birds that live upon fish; and the turn which the cavity takes almost directly upwards, and the gizzard being at the highest part instead of the lowest, are peculiarities, as far as I am acquainted, not met with in any other birds of prey. This mechanism, which will be better understood by examining the engraving, makes the obstacles to the food in its passage to the intestines unusually great; and enables the bird to digest both fishes and sea-worms with crustaceous shells. It appears to be given for the purpose of economizing the food in two different ways,—one retaining it longer in the cardiac cavity, the other supplying that cavity with a greater quantity of gastric liquor than in other birds. This opinion is further confirmed by the habits of life of this particular species of bird, which spends a portion of the year in the frozen regions of Nova Zembla, where the supplies of nourishment must be both scanty and precarious."

With respect to this statement and the reasonings founded upon it, it will be seen from the description and accompanying figures above, taken directly from nature, and without the least reference to the dissections or theories of any person, that the œsophagus and stomach of the Little Auk or Guillemot, *Alca Alle* of Linnæus, are very similar to those of other Auks, Guillemots, Divers, and fish-eating birds in general. The cardiac or proventricular cavity forms no curve; and the gizzard with which it is connected, is not small, nor has it merely a small portion of the internal surface on each side covered with a hard cuticular lining; for the epithelium covers its whole surface, and is of considerable extent. The gastric glands are not at all disposed as represented by Sir E. Home, but are aggregated in the form of a compact belt half an inch broad, Fig. 2, *b*, *c*. As to the ingenious reasoning by which the economy of the Little Auk is so satisfactorily accounted for, it is enough here to say, that having no foundation, it is of less than no value. But were there such a curvature as that in question, there could be no propriety in supposing that it presented any great obstacle to the passage of the food, or retained it longer than usual. Nor is the statement as to scanty and precarious supply of nourishment correct; for the Arctic Seas, to which this bird resorts in vast numbers, are represented by navigators as abounding in small crustacea, on which chiefly the Little Auk feeds, and that to such an extent as to colour the water for leagues. Besides, if there were such a scarcity of food in Nova Zembla, why should the birds go there? In short, the whole statement is incorrect; and the many compilers, from Dr. Carus to the most recent, who have pressed it into their service, may, in their future editions, with propriety leave it out, and supply its place with something equally ingenious.

The egg of this species measures one inch and nearly five-eighths in

length, one inch and an eighth in its greatest breadth. It is remarkably large for the size of the bird, and of a dull uniform pale greenish-blue.

Genus V.—URIA, *Lath.* GUILLEMOT.

Bill generally shorter than the head, stout, compressed, tapering, acute; upper mandible with the dorsal line slightly arched; the ridge narrow, broader at the base, the sides sloping, the edges sharp and inflected, the tip a little decurved, with a slight notch; nasal groove broad, feathered; nostrils at its lower edge, sub-basal, lateral, longitudinal, linear; lower mandible with the angle rather long, narrow, the dorsal line ascending and straight, the back very narrow, the sides nearly flat, the edges sharp and inflected, the tip acute. Head large, oblong; neck short and thick; body stout, elongated, rather depressed. Feet short, placed far behind; the greater part of the tibia concealed, its lower part bare; tarsus short, stout, compressed, anteriorly scutellate; toes three, of moderate length, middle toe longest, outer little shorter, scutellate, connected by entire webs. Claws small, slightly arched, compressed, rather acute. Plumage dense, very soft, blended. Wings rather short, narrow, acute; primary quills curved, tapering, the first and second longest; secondaries short, rounded. Tail very short, rounded, of twelve or more feathers.

H.R.H.

Black throated Guillemot

1 Adult 2 Young

Drawn from Nature by J.J.Audubon F.R.S.E.L.S.

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BLACK-THROATED GUILLEMOT.

URIA ANTIQUA, *Gmel.*

PLATE CCCCLXX.—ADULT AND YOUNG.

This species, which is said to occur on the north-west coast of America, has not been met with by me. The figures in the plate were taken from specimens in the Museum of the Zoological Society of London, by permission of the Council.

ALCA ANTIQUA, Gmel. Syst. Nat., vol. i. p. 551.
BLACK-THROATED GUILLEMOT, *Uria antigua*, Aud. Orn. Biog., vol. v. p. 100.

Adult, $10\frac{1}{2}$, wings, $5\frac{9}{12}$.
North-west coast of America. Abundant.
Adult.

Bill shorter than the head, stout, straightish, compressed toward the end; upper mandible with the dorsal line declinate and convex, the sides sloping, the edges sharp and overlapping, the tip rather obtuse; lower mandible with the angle long and rather wide, the dorsal outline ascending, straight, the sides sloping outwards and flattened, the edges thin and direct, the tip acute, with a slight sinus behind.

Body full and compact; neck short and thick; head rather large, ovate. Feet short, stout, placed far behind; tibia bare for a short space; tarsus very short, compressed, covered anteriorly with oblique scutella, behind with angular scales; hind toe wanting; anterior toes scutellate, of moderate length, connected by emarginate webs, the inner toe much shorter than the outer, which is nearly as long as the middle. Claws rather small, moderately arched, compressed, rather acute.

Plumage dense, blended, glossy. Wings of moderate length, narrow, pointed; primaries tapering, the first longest, the rest rapidly graduated, secondaries rounded. Tail very short, rounded.

Bill and feet yellow, claws dusky. The head and upper part of the neck are black, excepting a band of white elongated linear feathers, beginning over the eye and extending down the hind part of the neck, and a broad band of white commencing behind the ear and curving forwards, to join the

white which is the general colour of the lower parts, with the exception of the flanks, which are black. All the upper parts also are greyish-black.

Length to end of tail 10½ inches; bill along the ridge $\frac{7}{12}$, along the edge of lower mandible $1\frac{2}{12}$; wing from flexure $5\frac{9}{12}$; tail $1\frac{1}{2}$; tarsus $1\frac{1}{4}$; middle toe $1\frac{2}{12}$, its claw $\frac{4}{12}$.

Young fully fledged.

The young bird has the bill black, the feet dusky, the upper parts blackish-grey, each feather black in the centre, the lower greyish-yellow, transversely barred with dusky, the tail broadly tipped with white.

HORNED-BILLED GUILLEMOT.

URIA OCCIDENTALIS, *Bonap.*

PLATE CCCCLXXI.—ADULT.

This species is from the north-west coast of America, the figure was taken from a specimen lent to me for that purpose by the Prince of MUSIGNANO.

CERORHYNCHA OCCIDENTALIS, Bonap. Syn., p. 428.
WESTERN CERORHYNCHA, Nutt. Man., vol. ii. p. 538.
HORNED-BILLED GUILLEMOT, *Ceratorhyncha occidentalis*, Aud. Orn. Biog., vol. v. p. 104.

Adult, 15½, wing, $6\frac{1}{12}$.

North-west coast of America.

Bill shorter than the head, stout, straightish, broad at the base, the mouth measuring seven-eighths of an inch across, compressed toward the end; upper mandible with an oblong compressed knob on the ridge between the nostrils, beyond which the dorsal line is declinate and decurved toward the end, the sides sloping, the edges sharp, the tip narrow, obtuse, with a distinct notch immediately behind it; the gap-line slightly arched; lower mandible with the angle long and rather wide, the dorsal outline ascending and straight, the sides sloping outwards and flattened, the edges thin and direct, the tip acute. Nostrils linear, near the margin, pervious.

Body full and compact; neck short and thick; head large, ovato-oblong. Feet short, stout, placed far behind; tibia bare for a short space; tarsus very

Horned-billed Guillemot.

Drawn from Nature by J.J. Audubon, F.R.S. F.L.S.

Adult.

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Nº 95.
Pl. 472.
Large-billed Guillemot.
Drawn from Nature by J. J. Audubon F.R.S.F.L.S.
Male.
Lith.d Printed & Col.d by J. T. Bowen, Philad.a

short, anteriorly scutellate, laterally reticulate; hind toe wanting; anterior toes scutellate, of moderate length, connected by emarginate webs, the inner toe much shorter than the outer, which is nearly as long as the middle. Claws rather small, slightly arched, compressed, rather acute.

Plumage dense, blended, rather glossy on the upper parts. Wings of moderate length, narrow, pointed; primaries tapering, the first longest, the rest rapidly graduated, secondaries rounded. Tail very short, even, of sixteen elastic feathers.

Bill orange-yellow; feet greyish-yellow. The general colour of the upper parts is black, as are the cheeks, the upper part of the fore neck and its sides; the lower parts white. Two decurved white bands on the sides of the head, one commencing over the eye, the other at the angle of the mouth, both being formed by elongated, linear, acuminate feathers. The shafts of the wing-feathers are reddish-brown above, white beneath.

Length to end of tail 15½ inches, to end of claws 16¾; bill along the ridge $1\frac{5}{12}$, not including the outline of the knob, which is $\frac{4}{12}$ high, along the edge of lower mandible $1\frac{1}{12}$, breadth of upper mandible below the knob, $\frac{3}{8}$; wing from flexure $6\frac{10}{12}$; tarsus $1\frac{11}{12}$; inner toe $1\frac{9}{12}$, its claw $\frac{5}{12}$; middle toe 1½, its claw $\frac{6}{12}$; outer toe $1\frac{8}{12}$, its claw $\frac{5}{12}$.

THE LARGE-BILLED GUILLEMOT.

URIA BRUNNICHII, *Sabine.*

PLATE CCCCLXXII.—ADULT MALE.

I have never observed this bird on any part of the coast of our Middle Districts, and, although I was told that it not unfrequently occurred about the Bay of Boston, I failed in my endeavours to procure it there. The specimen from which my figure was made was sent to me in ice, along with several other rare birds, from Eastport in Maine. I received it quite fresh and in excellent plumage, on the 18th of February, 1833. It had been shot along with several other individuals of the same species while searching for food in the waters of Pasmaquody Bay, which were then covered with broken ice. Its flight was described by Mr. CURTIS, who sent it to me, as

similar to that of the Foolish Guillemot, with which it associated. No other information was transmitted, excepting that it dived and swam like the other species. I afterwards sent the skin to my friend the Rev. JOHN BACHMAN, in whose collection it remains.

No individuals of this species were observed by my party on our way to Labrador; and as the Foolish Guillemot was abundant on the coast of that country, I concluded that the Thick-billed Guillemots which visit our eastern seas in winter, set out for the far north at an earlier period than the others. I am indebted to Mr. HEWITSON of Newcastle, author of the "British Oology," for a description of an egg of this bird, which is in the valuable collection of the Messrs. HANCOCKS, who procured it from Greenland. It measures 3⅛ inches in length, by 2⅛ at its broadest part, and is of a bluish-green colour, streaked and spotted with black or very dark umber.

Male, 18½, 30.

Occasionally procured in Maine. Not very rare off the coast of Nova Scotia. Breeds from Hudson's Bay to the Arctic Seas.

URIA BRUNNICHII, Bonap. Syn., p. 424.

URIA BRUNNICHII, *Brunnich's Guillemot*, Swains. and Rich. F. Bor. Amer., vol. ii. p. 477.

LARGE-BILLED GUILLEMOT, Nutt. Man., vol. ii. p. 529.

LARGE-BILLED GUILLEMOT, *Uria Brunnichii*, Aud. Orn. Biog., vol. iii. p. 336.

Adult Male in winter.

Bill shorter than the head, stout, tapering, compressed, acute. Upper mandible with the dorsal line slightly curved, the ridge narrow, broader at the base, the sides sloping, the edges sharp and inflected, the tip a little decurved, with a slight notch. Nasal groove broad, feathered; nostrils at its lower edge, sub-basal, lateral, longitudinal, linear, pervious. Lower mandible with the angle medial, narrow, the dorsal line sloping upwards and straight, the back very narrow, the sides nearly flat, the edges sharp and inflected.

Head large, oblong, depressed, narrowed before. Eyes of moderate size. Neck short and thick. Body stout, rather depressed. Wings small. Feet short, placed far behind; the greater part of the tibia concealed, its lower portion bare; tarsus short, stout, compressed, anteriorly sharp, and covered with a double row of scutella, the sides with angular scales; toes of moderate length, the first wanting, the third longest, the fourth longer than the second, all covered above with numerous scutella, webbed, the lateral ones with small margins; claws small, slightly arched, compressed, rather acute, that of the middle toe largest, with a dilated inner edge.

Plumage dense, very soft, blended; on the head very short. Wings

No. 95.

Pl. 473.

W.E.B.

Foolish Guillemot-Murre.

1. Male. 2. Female.

Drawn from Nature by J.J. Audubon F.R.S.F.L.S.

Lith. Printed & Col. by J. T. Bowen, Philad.

rather short, narrow, acute ; primary quills curved, tapering, the second longest, the first slightly shorter, the rest rapidly graduated ; secondaries short, incurved, broad, rounded. Tail very short, rounded, of twelve narrow feathers.

Bill black. Iris dark brown. Feet dusky, tinged with red. The general colour of the plumage is greyish-black on the upper parts, those of the head tinged with brown. The sides of the head and neck, its fore part, the breast, abdomen, edges of the wings and the tips of the secondaries, white ; the sides shaded with greyish-black ; a line of the same behind the eye.

Length to end of tail 18½ inches, to end of claws 21½ ; extent of wings 30 ; wing from flexure 8 ; tail 2½ ; bill along the ridge $1\frac{2}{12}$, along the edge of lower mandible 2 ; tarsus $1\frac{4}{12}$; middle toe $1\frac{8}{12}$, its claw $\frac{5}{12}$. Weight 2¼lbs.

THE FOOLISH GUILLEMOT.—MURRE.

URIA TROILE, *Linn.*

PLATE CCCCLXXIII.—MALE AND FEMALE.

This bird is seldom found farther south than the entrance of the Bay of New York, where, however, it appears only during severe winters, for being one of the most hardy inhabitants of the northern regions, its constitution is such as to enable it to bear without injury the rigours of their wintry climates. About the bays near Boston the Guillemots are seen every year in greater or less numbers, and from thence to the eastward they become gradually more abundant. A very old gunner whom I employed while at Boston, during the winter of 1832–3, assured me, that when he was a young man this species bred on many of the rocky islands about the mouth of the bay there ; but that for about twenty years back none remained after the first days of April, when they departed for the north in company with the Thick-billed Guillemot, the Common Auk, the Puffin, and the Eider and King Ducks, all of which visit these bays in hard weather. In the bay of Fundy, the Foolish Guillemot is very numerous, and is known by the name of *Murre*, which it retains among all the eggers and fishermen of Newfoundland and Labrador, where it breeds in myriads. To those countries, then, I

must lead you, good reader, as there we can with ease study the habits of these birds.

Stay on the deck of the Ripley by my side this clear and cold morning. See how swiftly scuds our gallant bark, as she cuts her way through the foaming billows, now inclining to the right and again to the left. Far in the east, dark banks of low clouds indicate foul weather to the wary mariner, who watches the approach of a northern storm with anxiety. Suddenly the wind changes; but for this he has prepared; the topsails are snugged to their yards, and the rest are securely reefed. A thick fog obscures all around us. The waters, suddenly checked in their former course, furiously war against those which now strike them in front. The uproar increases, the bark is tossed on every side; now a sweeping wave rushes against the bows, the vessel quivers, while down along her deck violently pour the waters, rolling from side to side, seeking for a place by which they may escape. At this moment all about you are in dismay save the Guillemots. The sea is covered with these intrepid navigators of the deep. Over each tumultuous billow they swim unconcerned on the very spray at the bow of the vessel, and plunging as if with pleasure, up they come next moment at the rudder. Others fly around in large circles, while thousands contend with the breeze, moving directly against it in long lines, towards regions unknown to all, save themselves and some other species of sea birds.

The Guillemots pair during their migration;—many of them at least do so. While on my way toward Labrador, they were constantly within sight, gambolling over the surface of the water, the males courting the females, and the latter receiving the caresses of their mates. These would at times rise erect in the sea, swell their throats, and emit a hoarse puffing guttural note, to which the females at once responded, with numerous noddings to their beaux. Then the pair would rise, take a round in the air, re-alight, and seal the conjugal compact; after which they flew or swam together for the season, and so closely, that among multitudes on the wing or on the waves, one might easily distinguish a mated pair.

Not far from Great Macatina Harbour lie the Murre Rocks, consisting of several low islands, destitute of vegetation, and not rising high from the waters. There thousands of Guillemots annually assemble in the beginning of May, to deposit each its single egg, and raise its young. As you approach these islands, the air becomes darkened with the multitudes of birds that fly about; every square foot of the ground seems to be occupied by a Guillemot planted erect as it were on the granite rock, but carefully warming its cherished egg. All look toward the south, and if you are fronting them, the snowy white of their bodies produces a very remarkable effect, for the birds at some distance look as if they were destitute of head, so much does that

part assimilate with the dark hue of the rocks on which they stand. On the other hand, if you approach them in the rear, the isle appears as if covered with a black pall.

Now land, and witness the consternation of the settlers! Each affrighted leaves its egg, hastily runs a few steps, and launches into the air in silence. Thrice around you they rapidly pass, to discover the object of your unwelcome visit. If you begin to gather their eggs, or, still worse, to break them, in order that they may lay others which you can pick up fresh, the Guillemots all alight at some distance, on the bosom of the deep, and anxiously await your departure. Eggs, green and white, and almost of every colour, are lying thick over the whole rock; the ordure of the birds mingled with feathers, with the refuse of half-hatched eggs partially sucked by rapacious Gulls, and with putrid or dried carcasses of Guillemots, produces an intolerable stench; and no sooner are all your baskets filled with eggs, than you are glad to abandon the isle to its proper owners.

On one occasion, whilst at anchor at Great Macatina, one of our boats was sent for eggs. The sailors had eight miles to pull before reaching the Murre Islands, and yet ere many hours had elapsed, the boat was again alongside, loaded to a few inches of the gunwale, with 2500 eggs! Many of them, however, being addle, were thrown overboard. The order given to the tars had been to bring only a few dozens; but, as they said, they had forgotten!

The eggs are unaccountably large for the size of the bird, their average length being three inches and three-eighths, and their greatest breadth two inches. They are pyriform or elongated, with a slight compression towards the smaller end, which again rather swells and is rounded at the extremity. They afford excellent food, being highly nutritive and palatable, whether boiled, roasted, poached, or in omelets. The shell is rough to the touch, although not granulated. Some are of a lively verdigris colour, others of different tints, but all curiously splashed, as it were, with streaks or blotches of dark umber and brown. My opinion, however, is, that, when first dropped, they are always pure white, for on opening a good number of these birds, I found several containing an egg ready for being laid, and of a pure white colour. The shell is so firm that it does not easily break, and I have seen a quantity of these eggs very carelessly removed from a basket into a boat without being damaged. They are collected in astonishing quantities by "the eggers," and sent to distant markets, where they are sold at from one to three cents each.

Although the Guillemots are continually harassed, their eggs being carried off as soon as they are deposited, and as long as the birds can produce them, yet they return to the same islands year after year, and, notwithstanding all the efforts of their enemies, multiply their numbers.

The Foolish Guillemot, as I have said, lays only a single egg, which is the case with the Thick-billed Guillemot also. The Razor-billed Auk lays two, and the Black Guillemot usually three. I have assured myself of these facts, not merely by observing the birds sitting on their eggs, but also by noticing the following circumstances. The Foolish Guillemot, which lays only one, plucks the feathers from its abdomen, which is thus left quite bare over a roundish space just large enough to cover its single egg. The Thick-billed Guillemot does the same. The Auk, on the contrary, forms two bare spots, separated by a ridge of feathers. The Black Guillemot, to cover her three eggs, and to warm them all at once, plucks a space bare quite across her belly. These observations were made on numerous birds of all the species mentioned. In all of them, the males incubate as well as the females, although the latter are more assiduous. When the Guillemots are disturbed, they fly off in silence. The Auks, on the contrary, emit a hoarse croaking note, which they repeat several times, as they fly away from danger. The Foolish Guillemot seldom if ever attempts to bite, whereas the Razor-billed Auk bites most severely, and clings to a person's hand until choked. The plumage of all the birds of this family is extremely compact, closely downed at the root, and difficult to be plucked. The fishermen and eggers often use their skins with the feathers on as "comforters" round their wrists. The flesh is dark, tough, and not very palatable; yet many of these birds are eaten by the fishermen and sailors.

The young, which burst the egg about the beginning of July, are covered with down of a brownish-black colour. When eight or ten days old they are still downy, but have acquired considerable activity. As they grow up, they become excessively fat, and seem to be more at ease on the water than on the land. About the middle of August they follow their parents to the open sea, the latter being then seldom able to fly, having dropped their quills; and by the middle of September scarcely any of these birds are to be found on or near the islands on which they breed, although great numbers spend the winter in those latitudes.

There is no perceptible difference between the sexes as to colour, but the males are larger than the females. The white line that encircles the eye and extends toward the hind head is common to both sexes, but occurs only in old birds. Thousands of these Guillemots however breed without having yet acquired it, there merely being indications of it to be seen on parting the feathers on the place, where there is a natural division.

The flight of the Foolish Guillemot is rapid and greatly protracted, being performed by quick and unintermitted beatings. They move through the air either singly or in bands, in the latter case seldom keeping any very regular order. Sometimes they seem to skim along the surface for miles,

while at other times they fly at the height of thirty or forty yards. They are expert divers, using their wings like fins, and under water looking like winged fishes. They frequently plunge at the flash of the gun, and disappear for a considerable time. Before rising, they are obliged to run as it were on the water, fluttering for many yards before they get fairly on wing.

Those which I kept alive for weeks on board the Ripley, walked about and ran with ease, with the whole length of their tarsus touching the deck. They took leaps on chests and other objects to raise themselves, but could not fly without being elevated two or three feet, although when they are on the rocks, and can take a run of eight or ten yards, they easily rise on wing.

The islands on which the Guillemots breed on the coast of Labrador, are flattish at top, and it is there, on the bare rock, that they deposit their eggs. I saw none standing on the shelvings of high rocks, although many breed in such places in some parts of Europe. Their food consists of small fish, shrimps, and other marine animals; and they swallow some gravel also.

URIA TROILE, Bonap. Syn., p. 424.
URIA TROILE, *Foolish Guillemot*, Swains. and Rich. F. Bor. Amer., vol. ii. p. 477.
FOOLISH GUILLEMOT, or MURRE, Nutt. Man., vol. ii. p. 526.
FOOLISH GUILLEMOT, *Uria Troile*, Aud. Orn. Biog., vol. iii. p. 142.

Male, 17½, 30.

More or less abundant during winter on the coast of Massachusetts and Maine, rarely as far south as New York. Breeds in vast multitudes on the Rocky Islands of the Gulf of St. Lawrence, Newfoundland, and Labrador. Occasionally found in Hudson's Bay.

Adult Male, in summer.

Bill of moderate length, rather stout, tapering, compressed, acute. Upper mandible with the dorsal line slightly curved, the ridge narrow, broader at the base, the sides sloping, the edges short and inflected, the tip a little decurved with a slight notch. Nasal groove broad, feathered; nostrils at its lower edge, sub-basal, lateral, longitudinal, linear, pervious. Lower mandible with the angle medial, narrow, the dorsal line sloping upwards, and straight, the back very narrow, the sides nearly flat, the edges sharp and inflected.

Head oblong, depressed, narrowed before. Eyes rather small. Neck short and thick. Body stout, rather depressed. Wings rather small. Feet short, placed far behind; the greater part of the tibia concealed, its lower portion bare; tarsus short, stout, compressed, anteriorly sharp, and covered with a double row of scutella, the sides with angular scales; toes of moderate length, the first wanting, the third nearly longest, the fourth longer than the

second ; all covered above with numerous scutella, webbed, the lateral ones with small margins ; claws small, slightly arched, compressed, rather acute, the middle one larger, with a dilated inner edge.

Plumage dense, very soft, blended ; on the head very short. Wings rather short, narrow, acute ; primary quills curved, tapering, the first longest, the second little shorter, the rest rapidly graduated ; secondaries short, incurved, broad, rounded. Tail very short, rounded, of twelve narrow feathers.

Bill black ; inside of mouth gamboge-yellow. Iris dark brown. Feet black. The general colour of the plumage is greyish-black on the upper parts ; the sides of the head and upper part of the neck black, tinged with brown. A white bar across the wing, formed by the tips of the secondary quills, and a line of the same encircling the eye, and extending behind it. The lower parts white.

Length to end of tail 17½ inches, to end of claws 19¼, to end of wings 17½ ; extent of wings 30 inches ; wing from flexure 7½ ; tail 2 ; tarsus $1\frac{3}{12}$; middle toe $1\frac{7}{12}$, its claw $\frac{5}{12}$. Weight 2 lbs.

Adult Female.

The female is similar to the male, and, when mature, has the white line around and behind the eye.

THE BLACK GUILLEMOT.

URIA GRYLLE, *Linn.*

PLATE CCCCLXXIV.—ADULT IN SUMMER, ADULT IN WINTER, AND YOUNG.

It was a frightful thing to see my good Captain, HENRY EMERY, swinging on a long rope upon the face of a rocky and crumbling eminence, at a height of several hundred feet from the water, in search of the eggs of the Black Guillemot, with four or five sailors holding the rope above, and walking along the edge of the precipice. I stood watching the motions of the adventurous sailor. When the friction of the rope by which he was suspended loosened a block, which with awful crash came tumbling down from above him, he, with a promptness and dexterity that appeared to me

Black Guillimot

Drawn from Nature by J.J. Audubon F.R.S.E.L.S.

1. Adult - Summer Plumage - 2. Adult in Winter - 3. Young

Lith. Printed & Col.d by J.T. Bowen. Phila.a

quite marvellous, would, by a sudden jerk, throw himself aside to the right or left, and escape the danger. Now he would run his arm into a fissure, which, if he found it too deep, he would probe with a boat-hook. Whenever he chanced to touch a bird, it would come out whirring like a shot in his face; while others came flying from afar toward their beloved retreats with so much impetuosity as almost to alarm the bold rocksman. After much toil and trouble he procured only a few eggs, it not being then the height of the breeding season. You may imagine, good reader, how relieved I felt when I saw Mr. EMERY drawn up, and once more standing on the bold eminence waving his hat as a signal of success. This happened in one of the Magdeleine Islands, in the Gulf of St. Lawrence.

During severe winters, I have seen the Black Guillemot playing over the waters as far south as the shores of Maryland. Such excursions, however, are of rare occurrence, and it is seldom that any of these birds are to be seen until you reach the Bay of Boston. About the different entrances of the Bay of Fundy, this species is a constant resident, and many individuals breed in fissures, at a moderate height above the water, on the rocky shores of the Island of Grand Manan, and others in the same latitude. Proceeding farther toward the north-east, we found them on Jesticoe Island, and wherever else we happened to touch on our way to Labrador, in which country there is a regular nursery of these birds.

Unlike the Foolish and Thick-billed Guillemots, or the Razor-billed Auk, they do not confine themselves to any particular spot, but take up their abode for the season in any place that presents suitable conveniences. Wherever there are fissures in the rocks, or great piles of blocks with holes in their interstices, there you may expect to find the Black Guillemot.

Whether European writers have spoken of this species at random, or after due observation, I cannot say. All I know is, that every one of them whose writings I have consulted, says that the Black Guillemot lays only *one egg*. As I have no reason whatever to doubt their assertion, I might be tempted to suppose that our species differs from theirs, were I not perfectly aware that birds in different places will construct different nests, and lay more or fewer eggs. Our species always deposits three, unless it may have been disturbed; and this fact I have assured myself of by having caught the birds in more than twenty instances sitting on that number. Nay, on several occasions, at Labrador, some of my party and myself *saw* several Black Guillemots sitting on eggs in the same fissure of a rock, where every bird had three eggs under it, a fact which I communicated to my friend THOMAS NUTTALL. What was most surprising to me was, that even the fishermen there thought that this bird laid only a single egg; and when I asked them how they knew, they simply and good-naturedly answered that they had

heard so. Thus, reader, I might have been satisfied with the sayings of others, and repeated that the bird in question lays one egg; but instead of taking this easy way of settling the matter, I found it necessary to convince myself of the fact by my own observation. I had therefore to receive many knocks and bruises in scrambling over rugged crags and desolate headlands; whereas, with less incredulity, I might very easily have announced to you from my easy chair in Edinburgh, that the Black Guillemots of America lay only a single egg. No true student of nature ought ever to be satisfied without personal observation when it can be obtained. It is the "American Woodsman" that tells you so, anxious as he is that you should enjoy the pleasure of studying and admiring the beautiful works of Nature.

To satisfy yourself as to the correctness of the statements which he here lays before you, go to the desolate shores of Labrador. There, in the vernal month of June, place yourself on some granite rock, against the base of which the waves dash in impotent rage; and ere long you will see the gay Guillemot coming from afar by the side of its mate. They shoot past you on fluttering wings, and suddenly disappear. Go to the place; lay yourself down on the dripping rock, and you will be sure to see the birds preparing their stony nest, for each has brought a smooth pebble in its bill. See how industriously they are engaged in raising this cold fabric into the form of a true nest, before the female lays her eggs, so that no wet may reach them, from the constant trickling of the waters beneath. Up to the height of two or three inches the pebbles are gradually raised, the male stands by his beloved; and some morning when you peep into the crevice, you observe that an egg has been deposited. Two days after you find the number complete.

A closet-naturalist was quite surprised, I have been told, when he read in one of my volumes that Grakles form no nests in one portion of the United States, being there contented with merely dropping their eggs in the bottom of a Woodpecker's hole; while in the Middle States the same species forms a very snug nest. That *his* astonishment was great I do not in the least doubt, especially as I know how surprised I was to find the *Larus argentatus* breeding on fir-trees forty feet above the ground, and to see three eggs, instead of one, placed on a bed of small pebbles beautifully arranged, and every one belonging to a single pair of Black Guillemots. Yet, good reader, as I have also been told, the same person had no doubt whatever that ermines turn from brown to white in winter, that snakes and crabs cast off their skins and shells, and that "fleas are not lobsters;" but then the reason of his belief was simply that he had read of these things; and his doubts as to the Grakles arose from the facts having been recently

reported by a stranger from the "far west," who, it seems, talked of things which he had not read of before.

Whilst in Labrador, I was delighted to see with what judgment the Black Guillemot prepares a place for its eggs. Whenever the spot chosen happens to be so situated as to preclude damp, not a pebble does the bird lay there, and its eggs are placed on the bare rock. It is only in what I call cases of urgency that this trouble is taken. About fifty or sixty pebbles or bits of stone are then used, and the number is increased or diminished according to circumstances.

The eggs of this species, which appear disproportionately large, measure two inches and three-eighths in length, by an inch and five-eighths in breadth. Their form is regular; they are rather rough to the touch, although not granulated; their ground colour an earthy white, thickly blotched with very dark purplish-black, the markings larger and closer towards the great end, which, however, is generally left free of them. The shell is much thinner than that of the egg of the Foolish Guillemot or Razor-billed Auk. As an article of food they are excellent, being delicate and nutritious.

The parents pluck the feathers from a space across the lower part of their belly, as soon as incubation commences; and this bare place, when the bird is taken alive, it immediately conceals by drawing the feathers of the upper part of the abdomen over it, as if it were anxious that it should not be observed. When driven from the nest, the Black Guillemot at once runs out of its hiding-place and flies to the water, on which it plays, bathes as it were, dives a few times, and anxiously watches your retreat, after which it soon returns and resumes the arduous task of incubation.

The young, which are at first quite black, are covered with soft down, and emit, although in an under tone, the same lisping notes as their parents. Their legs, feet, and bill are black. The red colour of the legs of the old birds is much brighter during the breeding-season than at any other time, and the mouth also is bright red. About the first of August the Guillemots lead their progeny to the water, and although at this time neither old nor young are able to fly, they dive deeply and with great ease, which enables them to procure abundance of food, for at this season, lints, shrimps, and marine insects are plentiful in all the waters.

While in Labrador, I made a severe experiment to ascertain how long the Black Guillemot could live without food,—an experiment on which I have never since been able to think, without some feeling of remorse. I confined a pair of them in the fissure of a rock for many days in succession. After the entrance was securely closed, I left the place, and for eight days the wind blew so hard that no boat was safe on the waters without the harbour. Many a time I thought of the poor captives, and at last went to their retreat

one rainy afternoon, over a great swell of the sea. The entrance of the fissure was opened, and a stick pushed into the hole, when I had the pleasure of seeing both birds, although apparently in a state of distress, run out by me, and at once fly to the water.

The flight of the Black Guillemot is rapid and continued. As they proceed in their course, they alternately shew the black of their lower parts and the white of their wings. They walk on the rocks with considerable ease, using short steps, and whenever they wish to remove from one crag or block to another, make use of their wings. When their nests are very high above the water, they fly directly into them; and from such heights, if necessity demands it, they at once dive towards the water.

I kept many alive on board the Ripley. They ran on the floor in an erect position for a few yards, fell down on their breasts, rose again, and continued their exertions to escape until they got fairly concealed behind a chest or barrel.

The winter plumage of this species differs so greatly from that of summer, that I have been induced to present you with a figure of the bird in both states. It is difficult to perceive any external difference between the sexes, only the males are rather larger than the females. Their flesh, although black and tough, is not very unpalatable.

The trachea is flattened, with numerous close, transparent rings. The gullet, as in all the other species of this genus, is very dilatable. The gizzard, which is small, has its inner membrane thin and of a yellow colour. The intestines are about the thickness of a goose quill, and measure two feet eight inches in length.

URIA GRYLLE, Bonap. Syn., p. 423.
URIA GRYLLE, *Black Guillemot*, Nutt. Man., vol. ii. p. 523.
BLACK GUILLEMOT, *Uria Grylle*, Aud. Orn. Biog., vol. iii. p. 148; vol. v. p. 627.

Adult, 13⅞, 21½.

Accidental as far south, on the eastern coast, as New York; not rare from thence eastward, during winter. Breeds from the Bay of Fundy along all the rocky shores, to Labrador, and the highest latitudes, where considerable numbers even spend the winter.

Adult in summer.

Bill shorter than the head, straight, rather stout, tapering, compressed, acute. Upper mandible with the dorsal line nearly straight and sloping, towards the tip slightly arched, the sides sloping and towards the end a little convex, the edges sharp and slightly inflected. Nostrils basal, lateral, linear, partially concealed by the feathers. Lower mandible with the angle

long and very narrow, the dorsal line ascending, straight, the sides sloping upwards, slightly convex, flat at the base, the edges sharp and inflected, the tip acute.

Head of moderate size, oblong ; neck short ; body full, depressed ; wings rather small. Feet placed far behind, short, of moderate size ; tarsus short, compressed, anteriorly scutellate, laterally covered with reticulated angular scales ; toes rather slender, scutellate above, connected by entire reticulated webs, the outer and inner with a small marginal membrane ; the first toe wanting, the third and fourth about equal, the second shortest ; claws small, arched, compressed, rather obtuse, that of the middle toe with a dilated thin inner edge.

Plumage soft, close, blended and velvety ; feathers of the head very short, on the back broadly rounded, of the lower parts more elongated. Wings rather small ; primary quills curved, the first longest, the second little shorter, the rest rather rapidly diminishing ; secondary incurved, broadly rounded. Tail short, narrow, rounded, of twelve rather pointed feathers.

Bill black, inside of mouth vermilion tinged with carmine. Iris deep brown. Feet of the same colour as the mouth, claws black. The general colour of the plumage is deep black, on the upper part tinged with green, on the lower with red, there being only a large patch on each wing, including the secondary coverts and some of the smaller feathers, pure white, as are the lower wing-coverts. The quills and tail are tinged with brown.

Length to end of tail 13⅞ inches, to end of claws 16¼, to end of wings 13 ; extent of wings 21½ ; wing from flexure 6½ ; tail 2 ; bill along the ridge 1¼, along the gap 1⅞ ; tarsus 1 3/12 ; middle toe 1½, its claw ⅜. Weight 13½ oz.

Adult in winter.

The bill and iris are of the same colour as in summer, but the red of the feet is paler. The general colour of the plumage is white, the sides of the head, the neck all round, the lower parts, and the rump being of that colour, more or less shaded with grey. The upper part of the head obscurely mottled with greyish-black ; the back and scapulars black, each feather tipped with greyish-white, those of the latter more broadly. The wings and tail brownish-black, the former with the conspicuous white patch as in summer.

Young a few days old.

Bill and feet black, the former tinged with red ; iris dark brown. The general colour of the soft thick down with which the whole body is covered is brownish-black.

Male from Dr. T. M. Brewer. The palate is flat, with two papillate ridges, and a series of papillæ on each side, parallel to the posterior aperture of the nares, which is linear, and 10 twelfths long ; the anterior part con-

cave, with five prominent lines. Tongue 1¾ inches long, slender, tapering, trigonal, horny beneath, papillate at the base, and channelled towards the extremity, the tip pointed and thin-edged. Œsophagus 6½ inches long, 9 twelfths in width along the neck, within the thorax dilated into an enormous sac, 2 inches in length, 1¼ in breadth. The stomach is rather large, 1⅓ inches long, 1¼ broad; the epithelium dense, tough, light red, with strong longitudinal rugæ. The proventricular glands form a belt 1¼ inches in width, extending over the wider part of the sac. The left lobe of the liver is 2¼ inches long, the right lobe 3 inches; the gall-bladder 9 twelfths long, 4½ twelfths in breadth. The intestine is 4 twelfths in width; the cœca 1 inch 4 twelfths long, 3¼ twelfths in their greatest breadth, 2¼ inches distant from the extremity; the cloaca ovate, 10 twelfths long. Trachea 4 inches 4 twelfths long, from 4 twelfths to 2½ twelfths in breadth; the rings 115. Bronchial half rings 26. The tracheal rings are feeble, unossified, narrow in the middle and behind, as in the Auks, Gulls, Terns, and generally in all birds of which the rings are unossified. There are cleido-tracheal muscles, lateral muscles, sterno-tracheal, and a single pair of inferior laryngeal.

SLENDER-BILLED GUILLEMOT.

URIA TOWNSENDII, *Aud.*

PLATE CCCCLXXV.—ADULT AND YOUNG.

I have received not less than four specimens of this small Guillemot from Mr. TOWNSEND, who procured them on the north-west coast of America, not very far from the mouth of the Columbia river. The changes of colour in birds of this genus are well known to be considerable; and I have represented two individuals, supposing one to be an adult, and the other a young bird in its first plumage.

SLENDER-BILLED GUILLEMOT, *Uria Townsendi*, Aud. Orn. Biog., vol. v. p. 251.

Adult, 10; wing $5\frac{2}{12}$. Young, in autumn, 9¾; wing $5\frac{1}{12}$.

Slender-billed Guillemot

1. Male 2. Female.

Drawn from Nature by J.J. Audubon F.R.S.F.L.S. Lith.ª Printed & Col.ª by J. T. Bowen, Philad.ª

Abundant on the north-west coast of America, not far from the Columbia river.

Adult.

Bill shorter than the head, straight, slender, much compressed, acute. Upper mandible with the dorsal line convex and declinate, the ridge very narrow, the sides erect and convex toward the end, the edges sharp and inflected, with a distinct notch near the tip, which is rather acute and caniculate beneath. Nostrils medial, narrow near the margin, in the fore parts of the long nasal sinus, which is feathered. Lower mandible with the angle long and very narrow, the dorsal line ascending and straight, the sides nearly erect, but convex, the edges sharp and inflected, the tip very acute.

Head of moderate size, oblong ; neck short ; body full, depressed ; wings small. Feet placed far behind, very short and slender ; tarsus very short, reticulate ; toes slender, with numerous short scutella ; the first wanting ; the third or middle toe longest, the inner much shorter than the outer ; claws small, slightly arched, compressed, rather acute.

Plumage very soft, close, blended, rather glossy ; feathers of the head very short, of the back oblong, of the lower parts ovate. Wings small, very narrow, convex, falcate ; first quill longest, second a twelfth of an inch shorter, the rest rapidly diminishing ; secondaries incurved, obliquely rounded. Tail extremely short, narrow, rounded, of twelve weak, rounded feathers.

Bill black. Feet yellow ; claws black. The upper parts are brownish-black, the feathers of the back terminally margined with light grey ; the lower parts, cheeks, a transverse band on the nape, both eyelids, and a longitudinal band on each side, formed by some of the scapulars, white, some dusky streaks on the hind part of the sides, and the lower wing-covert greyish-brown, the larger tipped with dull-white.

Length to end of tail 10 inches ; bill along the ridge $\frac{9}{12}$, along the edge of lower mandible $1\frac{4}{12}$; wing from flexure $5\frac{2}{12}$; tail $1\frac{4}{12}$. tarsus $\frac{8}{12}$; middle toe $1\frac{1}{12}$, its claw $\frac{2}{12}$.

Young in autumn.

Bill and feet as in the adult. The upper parts are brownish-black, the feathers terminally margined with brown ; the occipital band is merely indicated by some lighter feathers, and the scapular band is brownish or chestnut-red. The lower parts have a curious mottled appearance, the feathers being brownish-grey at the end, but in the rest of their extent white, that colour appearing more or less on all parts, and showing a patch on the hind part of the sides.

Length to end of tail $9\frac{3}{4}$ inches ; bill along the ridge $\frac{7}{12}$, along the edge of

lower mandible $1\frac{3}{12}$; wing from flexure $5\frac{1}{12}$; tail $1\frac{2}{12}$; tarsus $\frac{7}{12}$; middle toe $\frac{11}{12}$, its claw $\frac{2}{12}$.

Two other individuals, apparently more advanced, or perhaps adults in winter, have the upper parts brownish-black; the lower white but finely mottled, a small portion of the extremity of each feather being greyish-dusky. The white bands on the hind neck and scapulars are formed, and the lower surface of the wing is brownish-grey.

FAMILY XLV.—COLYMBINÆ. DIVERS AND GREBES.

Bill of the length of the head, straight, rather stout, much compressed, pointed; upper mandible with the dorsal line declinate, almost straight, or towards the end convex; nasal groove rather long, feathered at the base. Nostrils basal, linear, direct, pervious. Feet stout, short, placed extremely far behind; tarsus extremely compressed; toes four, the first very small, and lobed; the anterior united by webs, which in some are lobed. Plumage dense, short, glossy, generally silky beneath. Wings small, very narrow, acute. Tail very short, sometimes extremely small, and forming a slight tuft. Tongue slender, trigonal, tapering; œsophagus very wide in its whole length, or narrowed in the anterior part with the proventriculus wide; stomach generally large, muscular, with a dense rugous epithelium: intestine rather long and wide; as are the cœca; cloaca globular.

Genus I.—COLYMBUS, *Linn.* DIVER.

Bill as long as the head, straight, rather stout, much compressed, tapering, pointed; upper mandible with the dorsal line descending, and slightly convex towards the end, the ridge convex, narrowed towards the point, the sides nearly erect, convex, the edges sharp and considerably inflected; the tip narrow; nasal groove rather long, feathered at the base. Nostrils basal, linear, direct, pervious; lower mandible with the angle extremely narrow and extending beyond the middle, the dorsal line straight and sloping towards the point, the ridge convex and narrow, the edges sharp and involute, the tip attenuated. Head of moderate size or rather large, oblong, narrowed before; neck rather long and thick; body elongated, much depressed. Feet short, rather large, placed very far back; tibia almost entirely concealed; tarsus short, exceedingly compressed, sharp-edged before and behind, covered all over with reticulated scales; toes four, hind toe extremely small, connected with the second by a very small membrane; anterior toes united by entire membranes, the outer longest, the third a little shorter, all scutellate. Claws very small, depressed, blunt. Plumage short and dense, the feathers in general oblong. Wings very small and narrow, curved, first quill longest, secondaries broad and rounded. Tail extremely short, rounded, of more than twelve feathers. Tongue long, trigonal, tapering; œsophagus very wide; proventriculus extremely dilated; stomach rather large, roundish, a little compressed, moderately muscular, with a rather thick, dense, longitudinally rugous epithelium; intestine rather long and wide; cœca rather long and wide; cloaca globular.

GREAT NORTHERN DIVER OR LOON.

COLYMBUS GLACIALIS, *Linn.*

PLATE CCCCLXXVI.—ADULT MALE AND YOUNG MALE.

The Loon, as this interesting species of Diver is generally called in the United States, is a strong, active, and vigilant bird. When it has acquired its perfect plumage, which is not altered in colour at any successive moult, it is really a beautiful creature; and the student of Nature who has opportunities of observing its habits, cannot fail to derive much pleasure from watching it as it pursues its avocations. View it as it buoyantly swims over the heaving billows of the Atlantic, or as it glides along deeply immersed, when apprehensive of danger, on the placid lake, on the grassy islet of which its nest is placed; calculate, if you can, the speed of its flight as it shoots across the sky; mark the many plunges it performs in quest of its finny food, or in eluding its enemies; list to the loud and plaintive notes which it issues, either to announce its safety to its mate, or to invite some traveller of its race to alight, and find repose and food; follow the anxious and careful mother-bird, as she leads about her precious charge; and you will not count your labour lost, for you will have watched the ways of one of the wondrous creations of unlimited Power and unerring Wisdom. You will find pleasure too in admiring the glossy tints of its head and neck, and the singular regularity of the unnumbered spots by which its dusky back and wings are checkered.

I have met with the Great Diver, in winter, on all the water-courses of the United States, whence, however, it departs when the cold becomes extreme, and the surface is converted into an impenetrable sheet of ice. I have seen it also along the whole of our Atlantic coast, from Maine to the extremity of Florida, and from thence to the mouths of the Mississippi, and the shores of Texas, about Galveston Island, where some individuals in the plumage characteristic of the second moult, were observed in the month of April, 1837. Indeed, as is the case with most other species of migrating birds, the young remove farther south than the old individuals, which are better able to withstand the cold and tempests of the wintry season.

The migratory movements of this bird seem to be differently managed in the spring and autumn. In the latter case, a great number of young Loons

N° 96
Pl. 476
Great North Diver Loon
1 Adult Diving in Winter
Drawn from Nature by J.J. Audubon F.R.S.F.L.S.
Lith^d Printed & Col^d by J. T. Bowen, Philad^a

are seen to alight on the head waters of our great streams, on which, without much exertion, being aided by the current, they float along, diving at intervals in pursuit of the numerous fishes, as they proceed toward milder climes. The few old birds which, at a later date, appear on the same water-courses, frequently take to wing, and shorten their way by flying at a considerable elevation, directly across the great bends or peninsulas. These modes of travelling are also adopted by those which advance along the Atlantic coasts, where, indeed, the birds have the double advantage of meeting with food and obtaining repose, on the rivers and on the sea. I think, however, that this maritime course is followed only by such of the Loons as have bred in the more immediate vicinity of the coast. But whether you are in the interior, or on the coast, it is seldom that you see at a time more than one Loon travelling at this season; whereas in spring, they proceed in pairs, the male taking the lead, as is easily ascertained by observing that the bird in the rear is the smallest.

Although its wings are rather small, its flight is strong and rapid, so that it is enabled to traverse a large extent of country on wing. When travelling, or even when only raised from its nest, it moves through the air with all the swiftness of the other species of its tribe, generally passing directly from one point to another, however distant it may be. Its long transits are at times performed at so great an elevation, that its form can scarcely be distinguished, and yet, even then, in calm weather, the noise of its wings striking the air comes distinctly on your ear. I have seen them thus, on their way towards Labrador, passing over the head waters of the Bay of Fundy, to cross the Gulf of St. Lawrence. Whenever it chances to alight on the water, in the course of its long journeys, it almost immediately dives, as if to taste the water, and judge whether it contains food suited to its appetite. On emerging, and after having somewhat raised the fore part of its body, shaken its wings, and by a strong shiver re-arranged its plumage, it emits its loud echoing call-note, to induce perchance some traveller of its tribe to alight for awhile, that they may communicate to each other their experience of the past, or their hopes of the future. There is an absurd notion entertained by persons unacquainted with the nature of this bird, that its plaintive cries are a sure indication of violent storms. Sailors, in particular, are ever apt to consider these call-notes as portentous. In the course of a voyage from Charleston to the Florida Keys, in May 1832, I several times saw and heard Loons travelling eastward; but notwithstanding all the dire forebodings of the crew, who believed that a hurricane was at hand, our passage was exceedingly pleasant. Although I have heard the notes of the Loon in rainy and blowy weather, yet I never heard them so frequent or so loud both by day and by night, as on the Ohio, during that

delightful and peculiarly American autumnal season, called the Indian summer; when, although not so much as a cloud was seen for weeks, I have frequently observed the passing birds checking their flight, or heard the murmuring plash which they produced on alighting upon the placid water, to rest and refresh themselves.

Another strange notion, not deserving of credit, although you will find it gravely announced in books, is that, when the Loon is breeding, it will dart down suddenly from the air, and alight securely in its nest. I have never witnessed such a procedure, although I have closely watched, from under cover, at least twenty pairs. On such occasions I have seen the incubating bird pass over the dear spot several times in succession, gradually rounding and descending so as at last to alight obliquely on the water, which it always did at a considerable distance from the nest, and did not approach it until after glancing around and listening attentively, as if to assure itself that it was not watched, when it would swim to the shore, and resume its office.

The Loon breeds in various parts of the United States, from Maryland to Maine. I have ascertained that it nestles in the former of these States, on the Susquehanna river, as well as in the districts between Kentucky and Canada, and on our great lakes. Dr. RICHARDSON states that it is found breeding as far north as the 70th degree of latitude. The situation and form of the nest differ according to circumstances. Some of those which breed in the State of Maine, place it on the hillocks of weeds and mud prepared by the musk-rat, on the edges of the lakes, or at some distance from them among the rushes. Other nests, found on the head waters of the Wabash river, were situated on the mud, amid the rank weeds, more than ten yards from the water. Authors have said that only one pair breed on a lake; but I have found three pairs, with their nests, on a pond not exceeding a quarter of a mile in length, in the State of Maine. One that I saw after the young had left it, on Cayuga Lake, in 1824, was almost afloat, and rudely attached to the rushes, more than forty yards from the land, though its base was laid on the bottom, the water being eight or nine inches deep. Others examined in Labrador were placed on dry land, several yards from the water, and raised to a height of nearly a foot above the decayed moss on which they were laid. But in cases when the nest was found at any distance from the water, we discovered a well beaten path leading to it, and very much resembling those made by the beaver, to which the hunters give the name of "crawls." The nest, wherever placed, is bulky, and formed of the vegetable substances found in the immediate vicinity, such as fresh or withered grasses and herbaceous plants. The internal part, or the true nest, which is rarely less than a foot, and is sometimes fifteen inches, in diameter, is raised upon the external or inferior mass to the height of seven or eight inches.

Such was one found on the 5th July, 1835, in Labrador, and which was placed within three yards of the edge of a considerable pond of limpid water, supposed to have been produced by the melting of the snow, and upwards of a mile distant from the sea. Of the many nests which I have examined, I have found more containing three than two eggs, and I am confident that the former number is that which more frequently occurs, although many European, and some American writers, who probably never saw a nest of this bird, allege the contrary. The eggs average three inches and three quarters in length, by two inches and a quarter in their greatest breadth, and thus are considerably elongated, being particularly narrowed from the bulge to the smaller end, which is rather pointed. They are of a dull greenish-ochry tint, rather indistinctly marked with spots of dark umber, which are more numerous toward the larger extremity. The weight of two of these eggs, containing young nearly ready to emerge, was ten ounces and a half. In Maine the Loon lays fully a month earlier than in Labrador, and about the same period as on the Wabash.

On approaching the female while sitting on her eggs, I assured myself that she incubates with her body laid flat upon them, in the same way as the domestic Duck, and that, on perceiving the intruder, she squats close, and so remains until he is almost over her, when she springs up with great force, and makes at once for the water, in a scrambling and sliding manner, pushing herself along the ground. On gaining the water, she dives at once, emerges at a great distance, and very rarely suffers herself to be approached within gunshot. Sometimes they swim so deeply immersed as scarcely to be perceptible, and keep as much as possible among the rushes and other water plants. When the eggs are on the eve of being hatched, the mother, when disturbed, often cries loudly and dismally for some time, but seldom flies off. At other times, when I found the eggs to have been recently laid, the bird, on reaching the water, and diving, swam lightly, flapping its wings, drank once or twice, and moved about at a respectful distance. On such occasions, should you persist in watching it, it rises on wing and flies off. Should you not mark the spot in which the nest is, but leave it to go in pursuit of the bird, you may search for hours before finding it, for the path leading from the water to it is generally covered over by the herbage. Once while approaching a spot in which I knew a Loon to be engaged in forming her nest, I was disappointed at not finding her at work: her keen sense of hearing had apprised her of my purpose, and cunningly must she have slipped away, for, on finding her absent, although I had not heard any noise, I happened to look toward the water, and there she was, gliding off in the quiet manner usual on such occasions.

The young of the Loon are covered at birth with a kind of black stiff

down, and in a day or two after are led to the water by their mother. They swim and dive extremely well even at this early stage of their existence, and after being fed by regurgitation for about a fortnight, receive portions of fish, aquatic insects, and small reptiles, until they are able to maintain themselves. During this period, grey feathers appear among the down of the back and belly, and the black quill-feathers of the wings and tail gradually elongate. They are generally very fat, and so clumsy as to be easily caught on land, if their retreat to the water be cut off. But should you miss your opportunity, and the birds succeed in gaining the liquid element, into which they drop like so many terrapins, you will be astonished to see them as it were run over the water with extreme celerity, leaving behind them a distinct furrow. This power of traversing the surface of the water is possessed, not only by the young and old of this species, but by all other kinds of swimmers, including even Gallinules and Coots. When the young are well able to fly, the mother entices them to remove from the pond or lake on which they have been bred, and leads them on wing to the nearest part of the sea, after which she leaves them to shift for themselves. Now and then, after this period, the end of August or beginning of September, I have still seen the young of a brood, two or three in number, continuing together until they were induced to travel southward, when they generally set out singly.

Having given you a figure of a young bird, taken in October, 1819, from a specimen obtained on the Ohio, I will not here trouble you with its description, but merely state that the young undergo their first moult in December, when they are seen singularly patched with portions of new plumage beautifully speckled with white, on a bed of almost uniform ash-brown. I was told, while in the State of Maine, that if the young were caught soon after being hatched, and before they had been in the water, they would, if thrown into it, immediately follow a paddled canoe anywhere; but, as I have not myself made the experiment, I cannot speak of this as a fact.

Although it has been generally asserted that Loons cannot walk or run in an efficient manner, I feel assured that on emergency the case is very different. An instance which occurred to my youngest son, JOHN WOODHOUSE, who accompanied me to Labrador, may here be related. One day, when he was in pursuit of some King Ducks, a Loon chanced to fly immediately over him within shooting-distance of his enormous double-barrelled gun. The moment was propitious, and on firing he was glad to see the bird fall broken-winged on the bare granitic rocks. As if perfectly aware of its danger, it immediately rose erect on its feet, and inclining its body slightly forward, ran on, stumbled, rose again, and getting along in this manner actually reached the water before my son, who is by no means slow

of foot. The space traversed was fully a hundred yards, and the water to an equal distance was not more than ankle-deep. The bird and its pursuer ran swiftly through the water, and just as both reached a sudden break about four feet in depth, the Loon, which had been wounded elsewhere than in the wing, expired and floated at the disposal of its enemy, who brought it on board the Ripley; when I entered this anecdote in my journal.

These birds are so very strong and hardy that some of the old ones remain in Maine and Massachusetts until all the fresh waters are frozen, first leaving the quiet lakes and ponds, then the slow streams, and lastly the turbulent pools below waterfalls, which latter they do not quit until they are overhung by icicles and deserted of fish. On the other hand, this species returns northward at a later period than most others that breed in high latitudes. I have witnessed the arrival of some on the coast of Labrador, after they had crossed the Gulf of St. Lawrence, as late as the 20th of June, after which they had scarcely four months to seek out a breeding place, lay their eggs, hatch and rear their young, and with them remove southward, before the rigour of winter commenced.

The Great Northern Diver is a heavy-bodied bird, and generally swims rather deep in the water, more especially if apprehensive of immediate danger, when scarcely more than two inches in height of its back can be seen above the surface. As its body is more flattened than that of the Cormorant, this circumstance might seem to favour the action in question; but other species less depressed exhibit the same peculiarity; and I have thought that in all of these the internal structure alone can account for this peculiar faculty.

With the exception of that most expert of all Divers, the Anhinga, and the Great Auk, the Loon is perhaps the most accomplished. Whether it be fishing in deep water amid rolling billows, or engaged in eluding its foes, it disappears beneath the surface so suddenly, remains so long in the water, and rises at so extraordinary a distance, often in a direction quite the reverse of that supposed to be followed by it, that your eyes become wearied in searching for it, and you renounce the wish of procuring it out of sheer vexation. At least, this has very frequently happened to me; nay, I have at times abandoned the chase when the bird was so severely wounded as to be obliged to dive immediately beside my boat, and had it not died of exhaustion and floated near enough to be seized by me, I felt as if I could not have pulled my oars any longer, and was willing to admit that I was outdone by a Loon.

In Labrador, where these birds were abundant, my son JOHN one day shot at one on wing, which fell upon the water to appearance quite dead, and remained on its back motionless until we had leisurely rowed to it, when a

sailor put out his hand to take it up. The Loon, however, to our surprise, suddenly sprung up, and dived, and while we stood amazed, watching its appearance, we saw it come up at the distance of about a hundred yards, shake its head, and disgorge a quantity of fish mixed with blood; on which it dived again, and seemed lost to us. We rowed however to the spot in all haste, and the moment it rose, sent another shot after it, which terminated its career. On examining it afterwards, we found it quite riddled by the heavy shot.

If ever so slightly wounded, the Loon prefers diving to flying off, and all your endeavours to kill it are almost sure to prove unavailing. You may shoot at it under such circumstances, but you will lose both your time and your ammunition. Its keenness of sight defies the best percussion-locked gun, for it is generally deep in the water before the shot reaches the spot where it has been. When fatigued with diving in the ordinary manner, it will sink backwards, like a grebe or a frog, make for some concealed spot among the rushes, and there lie until your eyes ache with searching, and your stomach admonishes you of the propriety of retiring.

Loons are now and then caught in fishermen's nets, and are soon drowned. I have also caught them with hooks fastened to lines laid across the Ohio, but on no such occasion have I taken the bird alive. A method of shooting these birds, which I have often practised, and which was several times successfully employed by our Labrador party, may here be related. On seeing a Loon on the water, at whatever distance, the sportsman immediately places himself under the nearest cover on the shore, and remains there as carefully concealed as possible. A few minutes are allowed to pass, to give the wary and sharp-sighted bird all due confidence; during which time the gun, charged with large shot, is laid in a convenient position. The gunner then takes his cap or pocket-handkerchief, which if brightly coloured is so much the better, and raising it in one hand, waves it three or four times, and then suddenly conceals it. The bird commonly detects the signal at once, and, probably imagining the object thus exhibited to be one of its own species, gradually advances, emitting its love-notes, which resemble a coarse laugh, as it proceeds. The sportsman imitates these notes, making them loud and yet somewhat mellow, waving his cap or kerchief at the same time, and this he continues to do at intervals. The Loon, in order to arrive more quickly, dives, perhaps rises within fifty yards of him, and calling less loudly, advances with considerable caution. He shews the signal less frequently, imitates the notes of the bird more faintly, and carefully keeps himself concealed, until the Loon, having approached within twenty or even ten paces, dives, and on emerging raises itself up to shake its wings, when off goes the shot, and the deluded bird floats dead on the water. Many species

of Ducks are procured in nearly the same manner. The male Turkey, in the gobbling season, and the stag in autumn, may also be drawn within shot by the same means. I once "tolled" two Loons with my hat from a distance of nearly half a mile, and although they were at one time so near to me that I could clearly perceive the colour of their eyes, I had no sure opportunity of firing at them, as it was in the pairing season, and they never once dived, or raised their wings to flap them, so that, knowing the extreme agility with which they disappear when they have heard a gun snap, I judged it useless to shoot. Until my visit to Labrador I had supposed, agreeably to the common belief, that the loons always repose at night on the water, which, however, I have since assured myself they rarely if ever do.

Colonel MONTAGU, than whom none has written more correctly on the habits of the birds of Great Britain, having procured a wounded Loon, placed it in a pond, and observed the manner in which it made its way under the surface of the water. "In swimming and diving," he remarks, "only the legs are used and not the wings, as in the Guillemot and Auk tribes, and by their position so far behind, and their little deviation from the line of the body, the bird is enabled to propel itself in the water with great velocity, in a straight line, as well as turn with astonishing quickness." This I have no doubt was the case with the individual observed; but that this is not the usual mode of proceeding of the species is equally true. Having myself seen Loons pass and repass under boats, at the distance of several feet from the surface, and propel themselves both with their feet, and their half-extended wings, I am inclined to believe that when not wounded, and when pursuing their prey, they usually employ all the limbs.

My friend THOMAS NUTTALL, who kept one for some time, gives the following account of its manners while in his possession. "A young bird of this kind which I obtained in the Salt Marsh at Chelsea Beach, and transferred to a fish-pond, made a good deal of plaint, and would sometimes wander out of his more natural element, and hide and bask in the grass. On these occasions he lay very still until nearly approached, and then slid into the pond and uttered his usual plaint. When out at a distance he made the same cautious efforts to hide, and would commonly defend himself in great anger, by darting at the intruder, and striking powerfully with his dagger-like bill. This bird, with a pink-coloured iris, like albinos, appeared to suffer from the glare of broad day-light, and was inclined to hide from its effects, but became very active towards the dusk of the evening. The pupil of the eye in this individual, like that of nocturnal animals, appeared indeed dilatable; and the one in question often put down his head and eyes into the water to observe the situation of his prey. This bird was a most expert and indefatigable diver, and remained down sometimes for several minutes,

often swimming under water, and as it were flying with the velocity of an arrow in the air. Though at length inclining to become docile, and shewing no alarm when visited, it constantly betrayed its wandering habits, and every night was found to have waddled to some hiding place, where it seemed to prefer hunger to the loss of liberty, and never could be restrained from exercising its instinct to move onwards to some secure or more suitable asylum."

The same valued friend has corroborated the result of my observations respecting the number of eggs usually laid by this species, by stating as follows: "About the 11th of June, through the kindness of Dr. J. W. HARRIS, I received three eggs, which had been taken from the nest of a Loon, made in a hummock, or elevated grassy hillock, at Sebago Pond, in New Hampshire."

The range of this species is immense. It occurs on the waters that fall into the Pacific Ocean, and has been observed on the Columbia river. In the Fur Countries it is plentiful; and, as I have already stated, it breeds in many parts of the United States. It is found equally in Europe, and the northern parts of Asia. In all these countries it moves southward on the approach of winter, and returns when the mild weather commences in spring.

Unlike the Cormorant, the Loon usually swallows its food under the water, unless when it happens to bring up a shell-fish or a crustaceous animal, which it munches for awhile before it swallows it. Fishes of numerous kinds, aquatic insects, water-lizards, frogs and leeches, have been found by me in its stomach, in which there is also generally much coarse gravel, and sometimes the roots of fresh-water plants.

Although the flesh of the Loon is not very palatable, being tough, rank, and dark-coloured, I have seen it much relished by many lovers of good-living, especially at Boston, where it was not unfrequently served almost raw at the table of the house where I boarded.

A female bird particularly examined by me presented the following appearances. From the point of the bill to the end of the tail it measured 34 inches; to the claws 41; the extended wings were 71; the bill measured 5 inches along the gap; the breadth of the body was 8 inches, its depth only four; the wings were 2 inches shorter than the tail; and the weight was 10 lbs. 11 oz. avoirdupois. The first primary was longest. The trachea, which was even and flattened, being in diameter about $\frac{5}{8}$ of an inch by $\frac{1}{2}$ inch, was 16 inches long. The eggs were numerous. The gizzard was moderate, and contained many large pebbles. The intestines were 7 feet long, and about the same size as a Swan's quill. Every bone and sinew was strong and tough. The tongue resembled in shape and size that of the Ivory-billed Woodpecker. The bones of the wing and leg were almost solid, the cavity

for the marrow being very small. All the bones of this specimen were presented to Mr. THOMAS ALLIS, of the Friends' Retreat, near York.

My friend Captain JAMES CLARK ROSS, of the Royal Navy of England, once placed at my disposal a specimen of the Loon procured in a very high latitude, and which, having closely inspected it, I found to differ from the one represented in the plate, only in having the point of the bill slightly elevated or recurved, and of a fine yellow tint. Dr. RICHARDSON informed me that, on one of his arduous northern journeys, he saw a very large and handsomely crested Diver, which, although somewhat prematurely, I propose honouring with the name of *Colymbus Richardsoni*.

GREAT NORTHERN DIVER or LOON, Wils. Amer. Orn., vol. ix.

COLYMBUS GLACIALIS, Bonap. Syn., p. 420.

COLYMBUS GLACIALIS, *Great Northern Diver*, Swains. and Rich. F. Bor. Amer., vol. ii. p. 474.

LOON or GREAT NORTHERN DIVER, Nutt. Man., vol. ii. p. 513.

GREAT NORTHERN DIVER or LOON, *Colymbus glacialis*, Aud. Orn. Biog., vol. iv. p. 43.

Adult, 32⅞, 57½. Young Male, in winter, 31¼, 54½.

During winter dispersed over the United States, in Texas, as well as along the coasts of the Atlantic, and the north-west. Breeds from Massachusetts northward to very high latitudes. Common.

Adult Male.

Bill as long as the head, straight, stout, much compressed, tapering to a point. Upper mandible with the dorsal line descending and slightly convex towards the end, the ridge convex, narrowed towards the point, the sides convex beyond the nostrils, the edges sharp and considerably inflected, the tip narrow and sharpish. Nasal groove short, nostrils basal, linear, direct, pervious. Lower mandible with the angle extremely narrow, and extending beyond the middle, the dorsal line straight and sloping upwards to the point, the ridge convex and narrow, the edges sharp and involute; the tip attenuated.

Head of moderate size, oblong, narrowed before. Neck rather long and thick. Eyes of moderate size. Body elongated, much depressed, of an elliptical form viewed from above. Wings small. Feet short, rather large, placed very far back; tibia almost entirely concealed; tarsus short, exceedingly compressed, sharp-edged before and behind, covered all over with reticulated angular scales; hind toe extremely small, connected with the second by a very small membrane; the anterior toes united by articulated membranes, the fourth or outer longest, the third a little shorter, the second considerably shorter than the third, all covered above with very numerous

narrow scutella, the second toe with a free two-lobed membrane; claws very small, depressed, blunt.

Plumage short and dense; of the head and neck very short, and blended; of the lower parts blended, short, with slight gloss; of the upper compact, glossy; the feathers in general oblong, those of the upper parts with the extremity abrupt. Wings proportionally very small and narrow, curved; primaries strong, tapering, the first longest, the second almost as long, the rest rapidly graduated; secondaries broad, and rounded. Tail extremely short, rounded, of twenty feathers.

Bill black. Iris deep bright red. Feet, tarsi, and toes, of a livid greyish-blue, their inner sides tinged with pale yellowish flesh-colour; claws black, lighter at the base; webs brownish-black, lighter in the middle. Head and neck dark greenish-blue, with purple reflections. On the throat a small transverse patch of white, longitudinally striated with dusky; about the middle of the neck, two large patches of the same, separated in front to the distance of an inch, behind continuous, but when the feathers are laid close, appearing as if separated by a longitudinal dark band about half an inch in breadth. The under parts glossy white, excepting the feathers on the sides under the wing, which are black, each with two, three, or four elliptical white spots, a faint dusky band across the vent, the lower tail coverts, which are brownish-black tipped with white, and the axillar feathers and larger wing-coverts, which have a dusky streak along the middle. The sides of the neck at its lower part are longitudinally streaked with black and white, there being two oblong spots of the latter on each feather towards the end. The upper parts are glossy black, variegated with spots of white in regular transverse slightly-curved lines having the convexity backwards. These spots vary in form and size, being small and roundish towards the neck and sides, larger and somewhat four-sided along the middle of the back: largest and rectangular on the scapulars, very small and roundish on the hind part of the back and tail-coverts. The upper part of the wing is similar, with smallish spots; the alula and quill brownish-black, a few of the inner secondaries only having two white spots at their extremity. Tail brownish-black, paler at the tip.

	Adult Male.	Adult Male.	Young.
Length to the end of tail,	32⅞	36	31¼
. . . . . claws,	39¼	40½	36
. . . . . wings,	31¼	—	29¾
. . . . . carpal joint,	16¾	—	16¼
Extent of wings,	37½	52	54½
Wing from flexure,	15½	—	14¼

Depth of body,	—	6	—
Breadth,	—	$9\frac{1}{2}$	—
Bill along the ridge,	—	$3\frac{4}{12}$	—
Gap-line,	—	$4\frac{1}{2}$	—
Tarsus,	—	$3\frac{3}{12}$	—
Hind toe,	—	$9\frac{1}{2}$	—
Its claw,	—	$\frac{2}{12}$	—
Outer toe and claw	—	$4\frac{1}{2}$	—
Middle toe,	—	$4\frac{1}{4}$	—
Inner toe,	—	$3\frac{9}{12}$	—
Tail,	—	$29\frac{1}{12}$	—
Wing from flexure,	—	$14\frac{1}{2}$	—
Weight,	$8\frac{3}{4}$	$8\frac{1}{2}$	9

The female is generally smaller, but in all other respects resembles the male. Weight 10 lbs. 11 oz.

Young in winter.

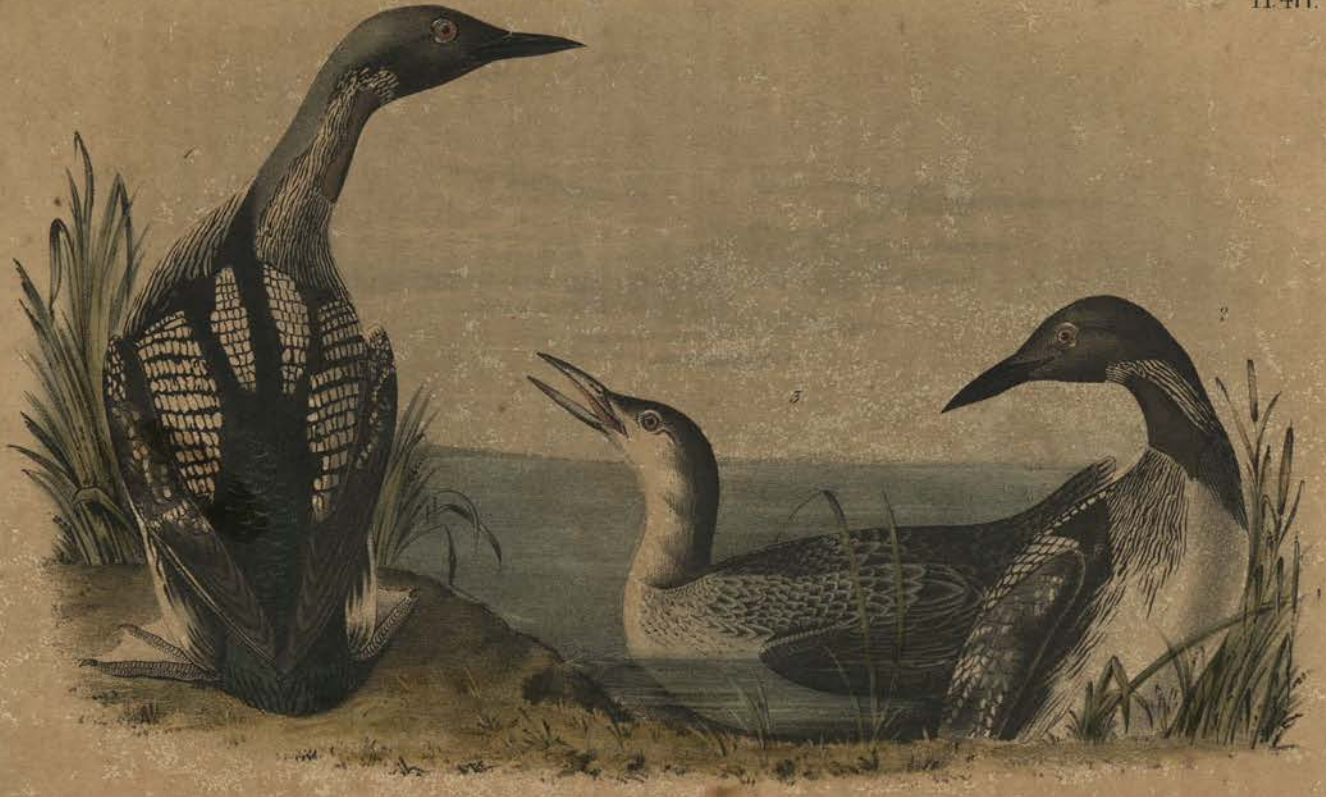
Bill pale yellowish-green, the ridge and tip of the upper mandible dusky. Iris brown. Feet dusky externally, pale yellowish flesh-colour internally, webs dusky, but yellow in the middle. Claws yellowish-brown. All the upper parts are of a uniform dark greyish-brown, each feather margined with lighter, the lower parts white; the sides of the neck at the lower part whitish, streaked with dusky; the sides dusky, without spots.

Towards spring the eye assumes a redder tint, and the plumage of the upper parts gradually becomes spotted with white; and when the moult is completed about the end of summer, the plumage is as in the adult, although the tints are improved at each successive moult for several years.

A fine male killed at Boston, 34 inches in length, with an alar extent of 56, presents the following characters. There is a general layer of subcutaneous adipose tissue, and the skin is very tenacious. The external aperture of the ear roundish, very small, having a diameter of only 2 lines. The tongue is two inches 1 line in length, fleshy, as high as broad, slightly concave and longitudinally grooved above, tapering to a horny point. On the palate are six rows of papillæ; the posterior aperture of the nares is linear, $2\frac{1}{2}$ inches in length. The aperture of the glottis is $\frac{1}{2}$ an inch long, with numerous papillæ along its sides and behind. The pharynx is extremely dilatable, as is the œsophagus, which is 17 inches long, passes along the right side of the neck, together with the trachea, and when distended has an average diameter of $2\frac{1}{2}$ inches, but on entering the thorax contracts to $1\frac{1}{2}$. The structure of the œsophagus in birds may be very conveniently examined in this species, the different layers being remarkably developed in it. Properly speaking, it has only two coats,—the outer muscular, its external

layer composed of transverse or circular fibres, the internal of equally distinct longitudinal fibres, which are not straight, but irregularly undulated. The inner, or mucous coat, when contracted, falls into longitudinal plaits. The proventriculus is $2\frac{3}{4}$ inches long, the glandules large, roundish, simple, and disposed in a continuous belt. Over this part, the transverse muscular fibres are remarkably developed. The right lobe of the liver is $5\frac{3}{4}$ inches long, the left lobe $5\frac{1}{2}$. The heart is very large, of a broadly conical form, 3 inches long, $2\frac{3}{4}$ inches in breadth. The stomach is three inches long, $2\frac{1}{2}$ in breadth of an elliptical form, a little compressed ; its lateral muscles 9 lines in thickness, and composed of strong large fasciculi ; the tendons $1\frac{1}{2}$ inches in diameter ; the cuticular lining thick, its upper and lower parts marked with strong longitudinal ridges having numerous transverse fissures ; the grinding surfaces irregularly wrinkled, with a deep fissure down the middle of each. The pylorus is 8 lines in diameter when distended, and is destitute of valve, but has a strong prominent rim. In the stomach were remains of fishes, and some pebbles, chiefly quartz, the largest 4 lines long. The intestine measures 6 feet 6 inches in length, and varies in diameter from 8 to 6 lines. The rectum is $3\frac{1}{2}$ inches long, the cloaca extremely large, forming a cavity about 3 inches in diameter. The cœca are $1\frac{3}{4}$ inches long, cylindrical, rounded at the extremity ; one of them 7 lines, the other 9 lines, in diameter.

The trachea, when moderately extended, measures $13\frac{1}{2}$ inches in length, inconsiderably depressed, its transverse diameter at the upper part $9\frac{1}{2}$ lines, at the lower $6\frac{1}{2}$ lines ; the rings cartilaginous, of moderate breadth, uniform, with a contraction in the middle before and behind, their number 134, the four lowest united. The bronchi are composed of about 20 narrow cartilaginous half rings. The contractor muscles are very broad, but thin, their fibres irregularly disposed in front ; they become thicker and narrower toward the lower part, and are continued beyond the sterno-tracheal muscles, which come off from the 20th ring from the inferior larynx, to the membrane between the last tracheal and first bronchial ring.



Black-throated Diver.

1. Male 2. Female 3. Young in Winter

Drawn from Nature by J.J. Audubon F.R.S.F.L.S.

Lith.d Printed & Col.d by J.T. Bowen Phil.a

BLACK-THROATED DIVER.

COLYMBUS ARCTICUS, *Linn.*

PLATE CCCCLXXVII.—MALE, FEMALE, AND YOUNG.

One of the most remarkable circumstances relative to this beautiful bird, which is intermediate between the Red-throated Diver and the Loon, is the extraordinary extent to which the wanderings of the young are carried in autumn and winter. It breeds in the remote regions of the north, from which many of the old birds, it would seem, do not remove far, while the young, as soon as they are able to travel, take to wing and disperse, spreading not only over the greater part of the United States, but beyond their south-western limits. In Texas I saw individuals of this species as late as the middle of April 1837 ; and I find it enumerated in a list of the birds observed by Mr. J. K. TOWNSEND on the Columbia river, where he also met with *Colymbus glacialis*. Its ramblings over a considerable portion of northern and eastern Europe have equally been noted, and it has been found breeding in the extreme north of Scotland.

For many years I knew the young of this bird only by the name "Imber Diver," applied by BEWICK to that of another species, and now have pleasure in looking upon a drawing of mine, made about thirty years ago, with that appellation attached to it. Very few old birds in full plumage have been procured within the limits of the United States, and none, in as far as I know, farther south than the Capes of Delaware.

No sooner has the foliage of the trees that border our western waters begun to drop and float on the gentle current of the fair Ohio, than the Black-throated Diver makes its appearance there, moving slowly with the stream. The Mississippi, Missouri, and their tributaries, are at the same period supplied with these birds. Along our eastern and southern shores they are seen from the end of autumn until spring.

Whilst in Labrador, I saw a few pairs courting on wing, much in the manner of the Red-throated Diver ; but all our exertions failed to procure any of the nests, which I therefore think must have been placed farther inland than those of the Loon or Red-throated Diver. I observed, however, that in their general habits they greatly resemble those species, for on alighting on the water, they at once immerse their bills, as if for the purpose

of ascertaining whether it yields a supply of suitable food, and afterwards raise themselves and beat their wings.

This species has almost as powerful a flight as the Great Northern Diver or Loon, and I think shoots through the air with even greater velocity. When flying it moves its wings rapidly and continuously, and has the neck and feet stretched out to their full length. I well recollect that while I was standing near the shore of a large inlet in South Carolina, one of these birds, being shot while passing over my head at full speed, did not, on account of the impetus, reach the ground until upwards of twenty yards beyond me. They are equally expert at diving, and fully as much so in eluding the pursuit of their enemies when wounded. I saw my friend Mr. HARRIS bring down one from on wing, on which NAPOLEON COSTE, and WILLIAM TAYLOR, captains of the revenue cutter and tender of which we had the use, paddled in pursuit of it in a light canoe; but, although they advanced with all the address of Indians, they proved unsuccessful, for after following it both in the Bay of Cayo Island, and in the Gulf of Mexico, for nearly an hour, they were obliged to return without it, having found it apparently not in the least fatigued, although it had dived sufficiently often to travel above two miles, shifting its course at each immersion. It is curious to observe how carefully these birds avoid the danger of sudden storms or heavy gales. On such occasions, I have seen Divers at once seek the lee of rocks, islands, or artificial embankments, where they could not only remain in security, but also procure their accustomed food. At other times, when striving against the tempest, they dive headlong from on wing, and are sure to reappear in the smooth parts which sailors term the trough.

I once caught one of these birds on the Ohio, it having been incapacitated from diving by having swallowed a large mussel, which stuck in its throat. It was kept for several days, but refused food of every kind, exhibited much bad humour, struck with its bill, and died of inanition. The food of this species consists of fish, aquatic reptiles, testaceous mollusca, and all sorts of small crustaceous animals. Its flesh resembles that of the Loon, and is equally unfit to be eaten.

The eggs, which are sometimes two, more frequently three, average three inches in length, by two in their greatest breadth, which is about a third of the whole length distant from the extremity. Their form is that of the Red-throated Diver, which however they exceed in size. The shell is rather thick, the surface roughish, the ground colour chocolate tinged with olive, sparingly spotted at the larger end with very dark umber and black, and sprinkled all over with very small dots of the same colour.

I have represented an adult male, a female, and a young bird.

COLYMBUS ARCTICUS, Bonap. Syn., p. 420.

COLYMBUS ARCTICUS, *Black-throated Diver*, Swains. and Rich. F. Bor. Amer., vol. ii. p. 475.

BLACK-THROATED DIVER, Nutt. Mann., vol. ii. p. 517.

BLACK-THROATED DIVER, *Colymbus arcticus*, Aud. Orn. Biog., vol. iv. p. 345.

Male, 29, 39½.

The young range throughout the interior and along the coast as far as Texas, in autumn and winter. Adult in full plumage very rare. Breeds in high latitudes. Columbia river.

Adult Male.

Bill as long as the head, straight, stout, higher than broad at the base, much compressed toward the end, and tapering to a point. Upper mandible with the dorsal line descending and considerably convex toward the end, the ridge convex, narrowed toward the point, the sides convex beyond the nostrils, the edges involute for half their length in the middle, direct at the base and toward the end, the tip narrow and sharpish. Nasal groove rather long and narrowed; nostrils sub-basal, linear, direct, pervious. Lower mandible with the angle extremely narrow, and very long, the dorsal line ascending and very slightly convex, the ridge convex and narrow, the edges sharp and involute, the tip attenuated.

Head of moderate size, oblong, narrowed before. Neck rather long and thick. Eyes of moderate size. Body elongated, much depressed, of an elliptical form viewed from above. Wings small. Feet short, rather large, placed very far back; tibia almost entirely concealed; tarsus short, exceedingly compressed, sharp-edged before and behind, covered all over with reticulated angular scales, hind toe extremely small, externally marginate, connected with the second for half its length by a membrane, which extends, narrowing, to the end; the anterior toes connected by articulated membranes, the fourth or outer longest, the third a little shorter, the second considerably shorter than the third; all covered above with numerous narrow scutella; the second toe with a free two-lobed membrane, the claws very small, depressed, blunt.

Plumage short and dense, of the head and neck very short, soft and blended; of the lower parts short, blended, stiffish, considerably glossed; of the upper compact, glossy; the feathers on the lower part of the sides of the neck much incurved, oblong, with the terminal barbs stiff; those of the fore part of the back and the scapulars straight, oblong, abrupt. Wings proportionally very small and narrow, curved; primaries strong, tapering, the first longest, the second slightly shorter, the rest rapidly graduated; secondaries very short, broad, and rounded. Tail extremely short, rounded, of eighteen feathers.

Bill black. Iris deep bright red. Feet greyish-blue, their inner sides tinged with yellow; claws black, that of the inner toe yellowish at the base. The upper part of the head and the hind neck are light grey or hoary, the fore part and sides of the head darker. The upper parts are glossy black, tinged with green anteriorly, and shaded with brown behind. On the fore part of the back are two longitudinal bands of transverse white bars, the feathers being tipped with that colour; the scapulars, excepting the outer, are marked in the same manner with transverse rows of rather large square spots. Most of the wing-coverts have two roundish spots of white near the end. The quills are blackish-brown, tinged with grey externally, paler on the inner webs; the tail also blackish-brown. The fore neck, to the length of six and a half inches, is purplish-black, ending angularly below, and with a transverse interrupted band of linear white spots near the upper part; beyond which the sides of the neck are blackish-brown, with several longitudinal white streaks, formed by the edges of the feathers; on the lower part of the neck a broad space is occupied by these longitudinal, dusky, and white streaks, the former of which gradually become narrow. The lower parts are pure white, excepting a longitudinal band on the sides under the wing, which is dusky.

Length to end of tail 29 inches, to end of wings $27\frac{1}{2}$, to end of claws 33; extent of wings $39\frac{1}{2}$; wing from flexure $12\frac{3}{4}$; tail $2\frac{3}{4}$; bill along the ridge $2\frac{5}{12}$, along the edge of lower mandible $3\frac{4}{12}$; tarsus $3\frac{1}{12}$; hind toe $\frac{8}{12}$, its claw $\frac{2}{12}$; second toe $3\frac{2}{12}$, its claw $\frac{5}{12}$; third toe $3\frac{8}{12}$, its claw $5\frac{5}{12}$; fourth toe $4\frac{1}{4}$, its claw $\frac{1}{12}$.

Adult Female.

The female is smaller than the male, but is similarly coloured.

Young in winter.

The texture of the plumage is less dense, the feathers on the neck being more downy, and those of the back oblong and rounded. The bill is light bluish-grey, dusky along the ridge; the iris brown; the feet more dusky. The upper part of the head and the hind neck are dark greyish-brown; the sides of the head greyish-white, minutely streaked with brown. The upper parts have a reticulated or scaly appearance, the feathers being brownish-black, with broad bluish-grey margins; the rump dull brownish-grey. The primaries and their coverts are brownish-black, the secondaries and tail-feathers dusky, margined with grey. The fore part of the neck is greyish-white, minutely and faintly dotted with brown, its sides below streaked with the same; the lower parts, including the under surface of the wing, pure white; the sides of the body and rump, with part of the lower tail-coverts, dusky, edged with bluish-grey.

When in their first downy plumage, the young are of a uniform brownish-black colour.

Red-throated Diver.

1 Male Summer Plumage 2 do Winter 3 Female 4 Young

Drawn from Nature by J.J. Audubon F.R.S.F.L.S.

Lith.d Printed & Col.d by J.T. Bowen Philad.a

THE RED-THROATED DIVER.

COLYMBUS SEPTENTRIONALIS, *Linn.*

PLATE CCCCLXXVIII.—MALE IN SUMMER, YOUNG MALE IN WINTER, FEMALE, AND YOUNG UNFLEDGED.

Whilst the icicles are yet hanging from the rocks of our eastern shores, and the snows are gradually giving way under the influence of the April rains, the Blue-bird is heard to sound the first notes of his love-song, and the Red-throated Diver is seen to commence his flight. Already paired, the male and female, side by side, move swiftly through the air, steering their course, at a great height, towards some far distant region of the dreary north. Pair after pair advance at intervals during the whole day, and perhaps continue their journey all night. Their long necks are extended, their feet stretched out rudder-like beyond the short tail, and onwards they speed, beating the air with great regularity. Now they traverse a great arm of the sea, now cross a peninsula; but let what may intervene, their undeviating course holds straight forwards, as the needle points to its pole. High as they are, you can perceive the brilliant white of their lower parts. Onward they speed in silence, and as I stand gazing after them, they have already disappeared from my view.

The middle of May has arrived; our woods are once more filled with the melodies of numberless warblers, and the Divers have ceased to be seen on our eastern coasts. To study their habits at this season, we must follow them to the islands in the mouth of the broad St. Lawrence, or to the granitic rocks of Labrador. The voyage cannot be performed without great expense, and may be attended with danger, but enthusiasm urges me on, and now my bark skims over the blue waters. At length arrived on the rocky shores, I prepare to visit the interior of that rude and moss-clad region. Thousands of little lakes are seen, on which are numberless islets richly clad with grass and sedge, the whole of which seems as if it had grown in a day, so tender are the fresh blades, and so pure their light green tint. High over these waters, the produce of the melted snows, the Red-throated Diver is seen gambolling by the side of his mate. The males emit their love-notes, and, with necks gracefully curved downwards, speed by the females, saluting them with mellow tones as they pass. In broad circles they wheel their

giddy flight, and now, with fantastic glidings and curves, they dive towards the spot of their choice. Alighted on the water, how gracefully they swim, how sportively they beat it with their strong pinions, how quickly they plunge and rise again, and how joyously do they manifest to each other the depth and intensity of their affection! Now with erected neck and body deeply immersed they swim side by side. Reynard they perceive cunningly advancing at a distance; but they are too vigilant for him, and down like a flash they go, nor rise again until far beyond his reach. Methinks I see them curiously concealed among the rank weeds under the bank of their own islet, their bills alone raised above the water, and there will they remain for an hour, rather than shew themselves to their insidious enemy, who, disappointed, leaves them to pursue their avocations.

The Red-throated Diver is found, in tolerable abundance, on the sea-coast of the United States during autumn, winter, and early spring, from Maryland to the extremities of Maine. The younger the birds, the farther south do they proceed to spend the winter, and it is rare to see an old bird, of either sex, at any season to the south of the Bay of Boston. Farther eastward they become more common, and they may be said to be plentiful towards the entrance of the Bay of Fundy, in the vicinity of which a few remain and breed. I found some in December, January, and February at Boston, where I procured males, females, and young birds. The old had the red patch on the throat rather darker than in the breeding season; the delicate grey and white lines on the neck were as pure as I observed them to be during summer in Labrador; and I have since been convinced that birds of this family undergo very little if any change of colouring after they have once acquired their perfect plumage, the Loon and the Black-throated Diver being included in this remark; while, on the contrary, all the Grebes with which I am acquainted, lose the beauty of their plumage as soon as the breeding season is over. This remarkable difference between the Divers and the Grebes would of itself be sufficient to separate the two genera, were there not also other distinctions. The Divers, moreover, live on the sea during the greater part of the year, and resort to ponds, lakes, or the borders of rivers to breed; whilst the Grebes spend most of their time on inland lakes, marshes, and streams. Immediately after the breeding season, as soon as the young are able to fly, the families of Divers make their way to the arms and inlets of the sea, rarely entering the fresh waters until the following spring.

The Red-throated Diver is at all times an extremely shy and vigilant bird, ever on the alert to elude its numerous enemies. The sight of man seems invariably to alarm it, even in the wildest countries in which it breeds. I have often observed that, while yet several hundred yards from

them, they marked my approach with great watchfulness. First they would dive and make their way to the farther end of the pond, after which, with outstretched necks, they would remain silent and motionless, until I approached within about a hundred yards, when, instead of diving again, as the Loon always does, they at once, with a single spring, rose from the water, and ere I had proceeded a few yards, they were already eight or ten feet above it. If I crept towards them through the tangled mosses or shrubs, they would swim about with their heads elevated, as if determined to make their escape on the appearance of imminent danger. In many instances, my party observed this species in small flocks of five or six in the same lake, when it happened to be of considerable extent; and as this was during the height of the breeding season, we concluded that these associated birds were barren, as I ascertained that males and females, when once paired, remain together until their young are able to fly, when they part company, until the next pairing season, which is about the first of March.

This species begins to breed in Labrador in the beginning of June, and about a fortnight earlier along the Bay of Fundy. The numerous nests which our party found in the former district were all placed on small sequestered islands in the middle of lakes or large ponds of fresh water, rarely more than one mile distant from the sea-shore. These nests consisted merely of a few blades of rank grasses loosely put together, and were quite flat, without any down to warm or conceal the eggs *at any period* of incubation. The nest was placed within a few feet of the water, and well-beaten tracks, such as are made by otters, led to it. Whenever the birds went to this spot they walked nearly erect in an awkward manner, but when they sat in their nest they laid themselves flat on the eggs, in the manner of a Goose or Duck. In no instance did they alight on the islands, but always on the water, at some distance, when, after examining all around them for awhile, they crawled silently out, and moved to the spot which contained their treasure.

Having been told that the Red-throated Diver covers its eggs with down in the manner of many Ducks, I was surprised to find the assertion incorrect, and having killed several individuals during the period of incubation and immediately after it, I carefully examined them, and found all of them fully covered with down, they being, in this respect, quite different from the Eider Duck, the Velvet Duck, the Harlequin Duck, and other species of that family, nay even from the Black Guillemot. Probably it is on account of those birds breeding much farther north, that, according to Dr. RICHARDSON, they there line their nest with down. We also found the *Colymbus glacialis* incubating without any in its nest. The idea generally entertained that the species never lays more than two eggs I found equally incorrect,

for of five nests, two contained two eggs each, two had three each, and the fifth had three young birds. The eggs measure 3 inches in length by 1¾ in breadth, and are of an elongated elliptical form, nearly equally rounded at both ends ; they are of a deep olive-brown colour, irregularly marked with spots of a darker dull brown. The male incubates as well as the female, and both are extremely solicitous about the safety of their young, which betake themselves to the water on the day succeeding that of their escape from the egg, and are from the first most expert swimmers and divers. Two of the young were shot by Captain EMERY, having been easily approached in the absence of their parents, at which he had shot without success, they not having yet learned from experience the danger of the proximity of man. They dived beautifully, and swam with great buoyancy, inclining their necks forwards, in the manner of the old birds. This was on the 5th of July, 1833. On the 15th of the same month, THOMAS LINCOLN and my son JOHN WOODHOUSE, saw several young ones, which, although quite small, were equally expert at diving. When swimming by the side of their mother they floated high, with the neck quite erect, while the old bird swam deep, with her neck inclined forward. When the little ones dived, they moved under the water like so many turtles, and at last were caught on the bottom of the pond, which was small and shallow, by placing the gun-rods upon them. So averse from moving are the old birds when sittiug on their eggs, that they will not bestir themselves until in imminent danger, on which, however, they scramble to the water, dive, and on emerging, immediately rise on wing without uttering any note. The male only is noisy on such occasions, and more especially when it returns from afar to its mate, when it evinces its satisfaction by calling aloud, as it repeatedly passes and repasses over the spot, and then alights in a pompous manner on the water.

The sexes differ materially in size, the male birds being much larger than the females, and weighing at an average fully a pound more. These birds are extremely tenacious of life. One which my son shot on the wing fell, dived instantly, and swam to a considerable distance under water, but returned to the surface, back downwards, and quite dead.

The notes of the Red-throated Diver are harsh and rather loud ; they resemble the syllables *cac*, *cac*, *cac*, *carah*, *carah*, enounced in rapid succession. In some instances the young men of my party found that the most successful method of approaching these birds whilst on the water, was to run as fast as possible towards them and shout loudly, for on such occasions the birds dived instead of flying at once, and on emerging again, afforded them much better chances as they took to wing. At certain times, when approached while they have young, they utter a soft plaintive note, which

evidently conveys to their offspring their wish that they should remain quiet in their hiding places.

The Red-throated Diver does not acquire the full beauty of its plumage until its fourth year. The young are at first covered with thick hairy down, of a blackish colour, inclining to brown. Before they are fully able to fly, this is changed into a dull grey on the upper parts, thickly sprinkled with white dots on the extremity of each feather, the lower parts being of a sullied white. During the second year these tints are firmer, there are fewer spots, and the texture of the lower parts is more silky. In the third, both sexes assume the fine grey of the hind neck, with its longitudinal white stripes, and here and there a few spots of red on the lower part of the throat. The next spring their plumage is perfect.

I have never observed any of these birds on our inland lakes or rivers. In the neighbourhood of Boston, and along the Bay of Fundy, they are best known by the names of "Scape-grace" and "Cape-racer." By the 9th of August the young birds had left the fresh-water lakes and ponds for the bays on the coast, and we were informed by the settlers, both in Newfoundland and Labrador, that, by the last days of September, none were to be found in those countries.

The dislike which this species shews to fresh-water after the breeding season is such, that they are rarely seen in the upper part of large bays, but prefer for their winter residence the shores of sea-islands and barren rocks. Thus, at that season, they are met with about the outer islands of the Bay of Fundy and those along our eastern coast.

While in fresh water, the Red-throated Diver feeds principally on small fish, shrimps, leeches, snails, and aquatic insects. The masses of feather-like substances often found in the stomachs of Grebes, I have never met with in this species. Its flesh is oily, tough, dark-coloured, and disagreeable to the taste, although I saw some mountain Indians feeding upon it at Labrador with apparent pleasure.

COLYMBUS SEPTENTRIONALIS, Bonap. Syn, p. 421.

RED-THROATED DIVER, *Colymbus septentrionalis*, Swains. and Rich. F. Bor. Amer., vol. ii. p. 476.

RED-THROATED DIVER, Nutt. Man., vol. ii. p. 519.

RED-THROATED DIVER, *Colymbus septentrionalis*, Aud. Orn. Biog., vol. iii. p. 20; vol. v. p. 625.

Male, 19, 25. Female, 18, 24.

Not uncommon during winter, autumn, and early spring, from Maryland eastward. Breeds in Newfoundland, Labrador, and as far north as the Arctic Seas.

Adult Male in summer.

Bill as long as the head, slender but strong, straight, rather compressed, tapering to a point. Upper mandible with the dorsal line almost straight, the ridge convex, as are the sides, the edges sharp and involute; nasal groove basal, short; nostrils basal, lateral, direct, oblong, pervious. Lower mandible with the angle extremely narrow and extending beyond the middle, the dorsal line straight and sloping upwards to the point, the ridge convex, but narrower than that of the upper mandible, the edges sharp and involute; the point of both mandibles rather sharp.

Head of moderate size, oblong, narrowed before. Neck rather long and slender. Eyes rather small. Body elongated, somewhat depressed. Wings small. Feet short, rather large, placed very far back; tibia almost entirely concealed; tarsus short, exceedingly compressed, sharp-edged before and behind, covered all over with reticulated angular scales; hind toe extremely small, connected with the second by a very small membrane; the anterior toes united by reticulated membranes, the fourth longest, the third a little shorter, the second considerably shorter than the third; all covered anteriorly with very narrow transverse scutella, the second toe with a free two-lobed membrane; claws very small, depressed, rounded.

Plumage short and dense; of the head and neck very short, blended; of the lower parts blended, short, and with a silky gloss; of the upper slightly glossed and somewhat compact; the feathers in general oblong and rounded. Wings proportionally very small and narrow, curved; primaries strong, tapering, first longest, second almost as long, the rest rapidly graduated; secondaries broad, rounded. Tail extremely short, rounded, of twenty rounded feathers.

Bill bluish-black. Iris deep bright red. Feet brownish-black, the anterior edge of the tarsus, the upper surface of the toes, the claws, and part of the webs, pale livid flesh-colour. Fore part and sides of the head, throat and sides of the neck, of a fine bluish-grey; fore part of the neck rich brownish-red; hind part of the head and hind neck longitudinally streaked with greenish-black and pure white, each feather black in the middle, with the sides white, the colours disposed in lines. The upper surface brownish-black, tinged with green, more or less mottled with white according to age, excepting the primary quills and the tail-feathers, the latter of which are merely paler at the end. The whole under surface pure white, excepting the feathers on the sides under the wings, some of those about the vent, and the lower tail-coverts, which are greyish-brown, with white margins and tips.

Length to end of tail 25½ inches, to end of claws 27; extent of wings 43$\frac{1}{12}$; bill 2$\frac{2}{12}$; gap 3$\frac{3}{8}$; tarsus 3; fourth toe and claw 3$\frac{3}{4}$; wing from flexure 11$\frac{3}{4}$; tail 3. Weight 4 lbs.

Adult Female in summer.

The female is precisely similar to the male in form and colouring, but is considerably smaller.

Length to end of tail 25 inches, to end of claws 28 1/2; extent of wings 43. Weight 3 lbs.

Male in winter immature.

In this state the principal differences are the following :—The fore part of the neck, instead of being of a uniform rich brownish-red, is merely mottled with that colour; all the feathers of the upper surface have each two white spots towards the end; the tail-feathers are edged and terminated with white; the colouring in general is somewhat less pure and deep, and the bill is of a much paler tint.

Young bird unfledged.

The young are at first covered with a dense elastic down of a greyish-black colour, tinged with brown. The bill is bluish-black, its basal edges yellow; the iris reddish-brown.

The width of the mouth is 10 twelfths; but the lower jaw is dilatable to 1½ inches. On the palate are two papillate ridges, with two series of papillæ on each side of the posterior aperture of the nares, which is oblongo-linear, 1¼ inches long, and margined with papillæ. On the anterior part of the upper mandible are three ridges. The tongue is 1 inch 8 twelfths long, very slender, trigonal, flat above, tapering to a horny point. Œsophagus, *a b c*, 14 inches in length, at its commencement 1½ inches in width, but at the lower part of the neck enlarging to 2 inches; on entering the thorax it contracts to 1½ inches; the proventriculus, *b c*, again enlarges to 2 inches, forming a very large ovate sac. The lobes of the liver are very large and nearly equal, the length of the one being 3 inches 10 twelfths, that of the other 3 inches 8 twelfths. The stomach, *c d e f*, is rather large, roundish, 1 inch 9 twelfths in diameter, a little compressed, its lateral muscles rather thin, the lower somewhat prominent. Its contents are remains of fishes, and a great quantity of small stones and pebbles. The epithelium is pretty thick, dense, with numerous longitudinal rugæ. The proventricular glands form a belt 1 inch 10 twelfths in breadth. The intestine is 4 feet 11 inches long; its average width 8 twelfths. The cœca, Fig. 2, *c c*, 2½ inches long, 4½ twelfths broad, towards the end 6 twelfths, with the extremity rounded. The rectum is 2 inches long, with a globular cloaca, *b*, 1½ inches in diameter.

Trachea 11½ inches long, much flattened, from 6 twelfths to 4 twelfths in breadth; the rings 145, with 2 dimidiate. Bronchi moderate, of 20 half rings. Lateral muscles strong; a single series of inferior laryngeal muscles going to the last half ring of the trachea.

Fig. 1

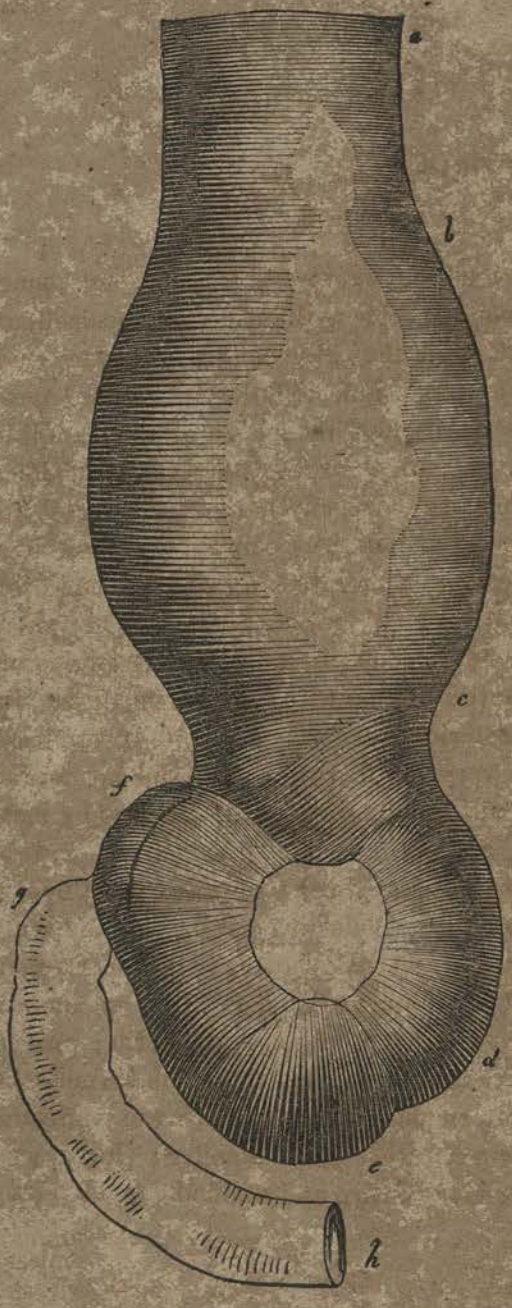
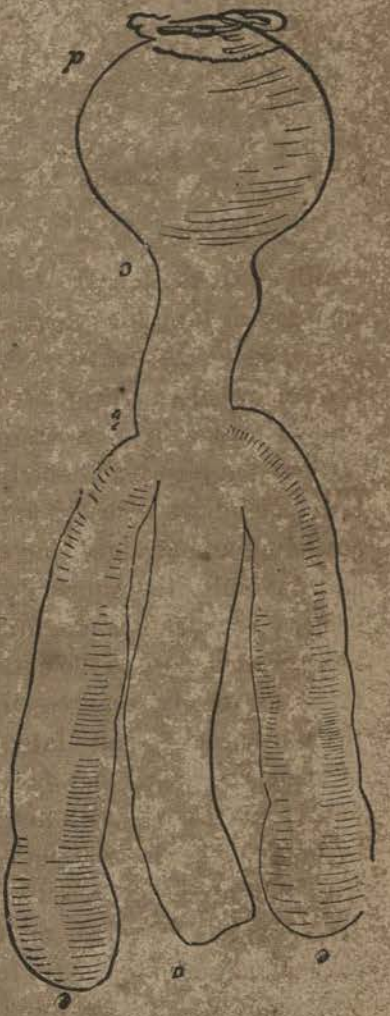


Fig. 2.



Genus II.—PODICEPS, *Lath.* GREBE.

Bill about the length of the head, or shorter, straight, rather stout, much compressed, tapering, pointed; upper mandible with the dorsal line declinate and more or less convex toward the end, the ridge convex, the sides erect and somewhat convex, the edges sharp and inflected, the tip narrow; nasal groove rather long, extending to nearly half the length of the mandible, feathered at the base; nostrils linear-elliptical, basal, rather small, pervious; lower mandible with the angle long and extremely narrow, the dorsal line ascending and straight, the sides erect and slightly convex, the edges sharp and involute, the tip acute. Head of moderate size, oblong, narrowed before; neck rather long and slender; body long, depressed. Feet short, large, placed close to the extremity of the body; tibia feathered to the joint; tarsus extremely compressed, its anterior edge with a row of small scutella, the sides broadly scutellate, the posterior ridge with a double row of small prominent scales; toes four, first very small, with a posterior membrane, fourth longest, all scutellate, the anterior connected at the base by membranes, and having on both sides an expanded web-like margin, marked with oblique lines. Claws flat, that of the third toe broadest. Plumage very soft and blended, on the lower parts dusky. Wings small, acute, curved, the second primary longest, the first little shorter; secondaries short and rounded. Tail a slight tuft of loose feathers, fourteen in number. Tongue slender, trigonal, pointed; œsophagus of moderate width; proventriculus very large, ovate; stomach extremely large, roundish, its muscular coat thin; the epithelium thick, soft, rugous; a small pyloric sac; intestine of moderate length and width; cœca rather long, slender; cloaca very large, globular. Bronchi with the rings entire and ossified.

THE CRESTED GREBE.

PODICEPS CRISTATUS, *Lath.*

PLATE CCCCLXXIX.—MALE AND FEMALE.

This beautiful species returns from its northern places of residence, and passes over the Western Country, about the beginning of September. A few remain on the lower parts of the Ohio, on the Mississippi, and the lakes in their neighbourhood, but the greater number proceed towards the Mexican territories. They pass swiftly through the air, at a height of about a hundred yards, in flocks of from seven or eight to fifty or more, proceeding in a loose body, and propelling themselves by continued flappings, their necks and feet stretched out to their full length. I have observed them thus passing in autumn, for several years in succession, over different parts of the Ohio, at all hours of the day. On such occasions I could readily distinguish the old from the young, the former being in many instances still adorned with their summer head-dress. I never saw this species near the sea-coast, where, on the contrary, I have met with the Red-necked Grebe.

When about to alight on the water, these birds glide swiftly downward, with their wings half-closed, and produce a sound not unlike that of a Hawk stooping towards its prey. Their velocity is so great at this moment, that on alighting, they glide on the surface of the water for twenty or thirty yards, leaving a furrow in their wake. In a few moments they are all engaged in washing and cleaning themselves, after which they dive in pursuit of the fishes on which they feed, and which they secure by following them in the manner of Divers and Cormorants. They are exceedingly quick-sighted, and frequently elude by diving the shot intended for their destruction, seldom after being chased raising more than their bill above the water, but rarely making for the shore unless when nearly exhausted.

When in ponds, they may easily be caught with fishing hooks placed on lines near the bottom; but if the lines are not closely attended to, or held from a place of concealment, where you may feel that they are hooked, and at once haul them out, the birds drown in a very short time. On catching two or three in this manner, I found the pond deserted the following morning and for several days after. They very rarely fly in your presence, and they leave the ponds at night. If forced to rise on wing, they run

Crested Grebe.

1 Adult Male in Spring. 2 Young (first Winter.)

Drawn from Nature by J.J. Audubon, F.R.S. F.L.S.

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paddling on the water for several yards before they rise, and fly several times round a pond of thirty or forty yards before they attain the level of the tree-tops, for they never fly through the woods. When once high in the air, they move in a direct course and with speed towards some other pond or the nearest river. I do not remember to have ever met with a bird of this species on a narrow creek or bayou, or on muddy waters; and on the Ohio's rising I have observed that they abandon the river and betake themselves to the clear ponds of the interior.

By the 1st of October, scarcely any difference can be perceived between the young and the old birds with respect to plumage, only the latter have the under surface of the wings still dashed with the reddish colour of the summer dress. I am not able to say from observation how long the young are in attaining maturity; but European writers assert that they take three or four years. When these birds leave the southern waters about the beginning of April, the old already shew their summer head-dress, but seldom have it so perfect as is represented in the plate.

The food of this species consists of fishes, aquatic insects, and small reptiles, together with the seeds of water plants. Dr. RICHARDSON states that these birds are abundant in all the secluded lakes of the mountainous districts of the Fur Countries, and adds that their nests are formed of a large quantity of grass, placed among reeds and carices, and rise and fall with the water. Mr. YARRELL has kindly furnished me with specimens of the eggs, which are generally four, measure two inches and a quarter in length by one inch and a half, and have an oval form, and a smooth surface, of a uniform yellowish-white colour.

PODICEPS CRISTATUS, Bonap. Syn., p. 417.
PODICEPS CRISTATUS, *Crested Grebe*, Swains. and Rich. F. Bor. Amer., vol. ii. p. 410.
CRESTED GREBE, or GANNET, Nutt. Man., vol. ii. p. 250.
CRESTED GREBE, *Podiceps cristatus*, Aud. Orn. Biog., vol. iii. p. 595.

Male, 24, 33.

Not uncommon during autumn and early spring on all the larger streams of the Western Country, as well as on the coast of the Atlantic, from Nova Scotia to Texas. Breeds in the mountainous parts of the Fur Countries, Rocky Mountains, and high latitudes. Migratory.

Adult Male in spring.

Bill about the length of the head, straight, compressed, tapering. Upper mandible with the dorsal line straight, slightly declinate toward the tip, the ridge convex, the sides convex, the edges sharp and inflected, the tip rather sharp: Nasal groove rather wide, extending to nearly half the length of

the mandible; nostrils linear-elliptical, basal, rather small, pervious. Lower mandible with the angle long and extremely narrow; dorsal line beyond it ascending and straight, sides erect, slightly convex, tip acuminate, edges sharp.

Head of moderate size, oblong, compressed. Neck long, slender. Body long and depressed. Feet short, large, placed close to the extremity of the body; tibia feathered to the joint; tarsus extremely compressed; its anterior edge with a row of small scutella, the sides with broad scutella, behind which are some irregular scales, the posterior ridge with a double line of small prominent scales; first toe very small, with a posterior membrane, fourth longest; the toes scutellate above, connected at the base by a membrane, and having on both sides an expanded web-like margin marked with oblique lines, and having a crenated edge. Claws flat, that of third toe broadest.

Plumage very soft, blended, on the lower parts silky, on the back glossy and rather compact. Two tufts of elongated feathers on the occiput, and a large frill on the sides and anterior portion of the neck at its upper part. Wings small, acute; primaries much curved, second longest, first almost equal, the rest rapidly graduated; secondaries short, rounded. Tail a slight tuft of loose feathers.

Bill blackish-brown tinged with carmine; bare loral space dusky-green, as is the edge of the eyelids. Iris bright carmine. Feet greyish-black, the webs greyish-blue. Upper part of the head and tufts greyish-black tinged with green, as is the hind part of the ruff, its anterior part being brownish-red; side of the head and the throat white; fore neck white tinged with brown; breast silvery white, sides reddish-brown with dusky streaks; the upper parts are brownish-black, the feathers edged with lighter, the sides of the neck tinged with reddish, as is the rump. Wing-coverts greyish-brown, primary quills brownish-black, tips of the inner white, the middle secondaries white.

Length to end of tail 24 inches, to end of wings 21, to end of claws 29; extent of wings 33; wing from flexure 7½; bill along the ridge 2, along the edge of lower mandible 2$\frac{7}{12}$; tarsus 2½; third toe $\frac{3}{4}$, its claw ½. Weight 2 lbs. 9 oz.

Adult Female in spring.

The female has the occipital feathers a little elongated, but wants the ruff on the neck. Bill dusky-green; bare loral space, edges of eyelids, and iris, as in the male. Upper part of head and hind neck blackish-grey; back and wings as in the male, but more tinged with grey; lower parts silvery white, the sides under the wings dusky.

Length to end of tail 19½, to end of claws 24¼; extent of wings 30; bill

along the back $2\frac{1}{4}$, along the edge of lower mandible $2\frac{3}{4}$; tarsus $2\frac{1}{4}$; third toe $2\frac{1}{4}$, its claw $\frac{1}{4}$. Weight 1 lb. $6\frac{1}{2}$ oz.

The following account of the digestive organs of this species was taken from an adult male.

The œsophagus is nine and a half inches long; at its commencement, and for an inch and a half, it has a diameter of half an inch, for the next two inches only two twelfths, towards the lower extremity four twelfths; this, however, in the contracted state, the specimen having been kept in spirits. The mucous coat is raised into numerous longitudinal folds.

The walls of the proventriculus are extremely thick, the glands cylindrical, generally about a quarter of an inch long, and one-twelfth in diameter. The stomach is roundish, compressed, the muscular coat very thick, being that of a true gizzard, the tendons nearly half an inch in diameter; the inner coat thick, the cuticular lining very thick and rugous.

Between the orifice of the œsophagus and the pylorus is a rounded lobe, from the lower part of which the intestine comes off. The pylorus has no valve, but a thick marginal rim. The intestine, immediately after its commencement, dilates to the diameter of half an inch, and continues of that size for twelve inches, then gradually contracts for about six inches, when its diameter is four-twelfths, and again within six inches of the cœca becomes enlarged. The cœca come off at the distance of two inches from the anus, and are an inch and a half in length, a little enlarged towards their extremity, and rounded. The rectum is half an inch in diameter, the cloaca one inch. The entire length of the intestine is forty-two inches.

The heart is conical, rather pointed, and slightly curved. The trachea is flattened, of uniform diameter, the rings complete, 167 in number, its transverse diameter two inches and half a twelfth, contracted at the bifurcation to two-twelfths.

The tail of the Grebes is usually described as a small tuft of feathers; but on carefully removing the coverts and downy parts, the tail may be satisfactorily traced. In this species there are 14 feathers, on each side 7 arranged in a semicircular manner. The two middle feathers are separated to the distance of about $\frac{2}{12}$, and the two outer or lateral approach each other below, leaving an interval of about the same space. When the feathers are broken across near their bases, which they frequently are, there is thus produced the appearance of a small circular tuft. When perfect, they are about $1\frac{1}{2}$ inches long, arched, with loose barbs, downy at their extremities.

THE RED-NECKED GREBE.

PODICEPS RUBRICOLLIS, *Lath.*

PLATE CCCCLXXX.—MALE AND YOUNG.

I have found this species along the coast of New York to Maine, in the winter season, when old and young were generally in about equal number. At Boston I procured several specimens. On the Bay of Fundy and among the islands at its entrance, I saw these Grebes already in their spring plumage, it being then the beginning of May. On one occasion our boat was rowed over an eddy in which a pair had dived in search of food. On emerging they were only a few yards distant; but, although several guns were fired at them, they escaped unhurt, for they instantly dived again, passed under the boat at the depth of about a yard, and did not rise until at a safe distance. None of us could conceive how they had managed to elude us, for as they were so near, the shot threw up the water in its course, and I had expected to find them completely mangled.

Although I have seen this species far up our salt-water bays, I never observed it on any of the southern fresh-water ponds or rivers. Dr. RICHARDSON states, in the Fauna Boreali-Americana, that it "is very common in the Fur Countries, frequenting every lake with grassy borders." M. TEMMINCK says "that they inhabit rivers, lakes, and the borders of the sea, but in greater number on fresh-waters; are tolerably common in different parts of Europe; feed on small fish, fry, amphibious reptiles, insects, and vegetables; form their nests of the same materials, and place it in the same situations as the Crested Grebe, and lay three or four eggs." An egg lent me by my esteemed friend Mr. YARRELL, measured two inches in length by one inch and a quarter in breadth, and was of a uniform pale greenish-white.

PODICEPS RUBRICOLLIS, Bonap. Syn., p. 417.

PODICEPS RUBRICOLLIS, *Red-necked Grebe*, Swains. and Rich. F. Bor. Amer., vol. ii. p. 411.

RED-NECKED GREBE, Nutt. Man., vol. ii. p. 253.

RED-NECKED GREBE, *Podiceps rubricollis*, Aud. Orn. Biog., vol. iii. p. 617; vol. v. p. 620.

Male, 18¾, 32.

Red-necked Grebe.

1. Adult Male Spring Plumage 2. Young Winter Plumage.

Drawn from Nature by J.J. Audubon F.R.S.F.L.S.

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During winter, not uncommon from New York to Maine. Breeds in the Fur Countries. Accidental in the interior.

Adult Male.

Bill about the length of the head, straight, rather slender, compressed, acute. Upper mandible with the dorsal line straight and slightly sloping to the middle, then slightly convex, the ridge convex, the sides sloping, towards the end erect and convex, the edges acute and inflected. Nasal groove extending to the middle of the mandible; nostrils sub-basal, linear-elliptical, pervious. Lower mandible with the angle long and extremely narrow, the dorsal line ascending and straight, the sides erect, slightly convex, the edges sharp, inflected, the tip narrow, very acute.

Head of moderate size, oblong, compressed. Neck long and slender. Body depressed. Feet large, placed very far behind; tibia feathered almost to the joint; tarsus short, extremely compressed, anteriorly with a narrow scutellate ridge, laterally with very broad scutella, posteriorly with a narrow ridge having a double row of small prominent scales. Hind toe very small, with an inferior small membrane; fore toes long, the outer longest, scutellate above, united at the base by short webs, externally margined with narrowish, internally with broad, lobe-shaped expansions, which are marked with parallel oblique lines, and crenate on the edges. Claws flattened, that of the middle toe broadest, with an extremely thin, broad terminal edge.

Plumage of the head and neck very soft and downy, of the breast and sides silky and highly glossed, of the abdomen and rump downy, of the upper parts imbricated, but with loose edges. Wings small; primaries much curved, the first longest, the second almost equal, the inner secondaries extending beyond the first primary when the wing is closed. Tail a small tuft of loose feathers. On the head is a tuft of elongated feathers on each side behind the eye, and those of the posterior part of the cheek are also elongated.

Bill brownish-black, bright yellow at the base. Iris carmine. Tarsi and toes greenish-black externally, yellow on the inner side, the edges of the lobes dusky. Upper part of the head greyish-black, lower part ash-grey, with a white line from the base of the lower mandible to beyond the eye. Hind part of the neck, and upper parts generally, greyish-black; the feathers edged with pale brown; the edge of the wing and the outer secondaries white. The fore part and sides of the neck rich brownish-red; the breast and sides are of a silvery white faintly marked with grey.

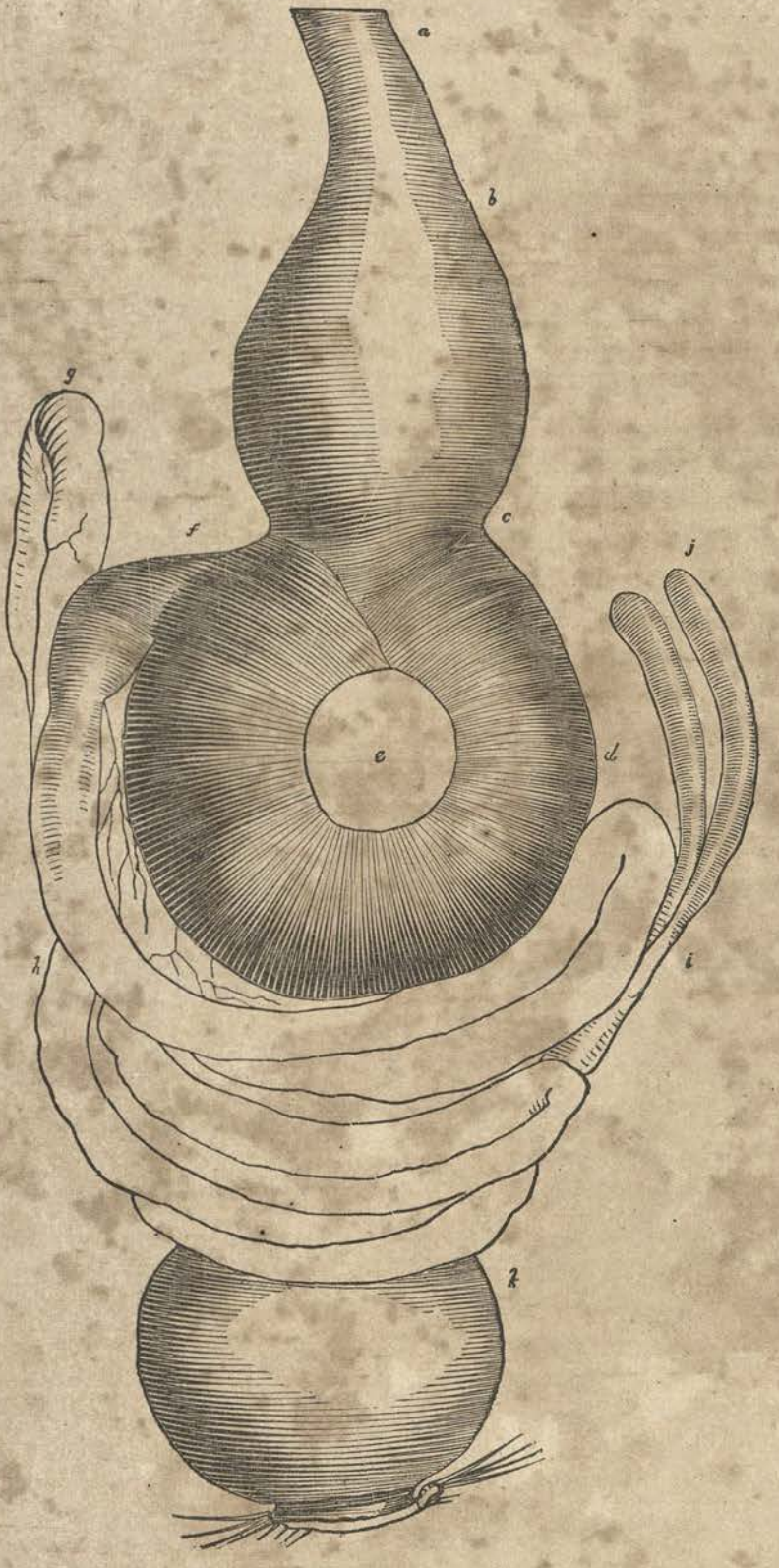
Length to end of rump-feathers 18¾ inches, to end of wings 16½, to end of claws 24; extent of wings 32; wing from flexure 7¼; bill along the back 1⅛, along the edge of lower mandible 2⅜; tarsus 2; outer toe 2½, its claw ¼. Weight 23 oz.

Young after first moult.

Bill bright yellow, the ridge of the upper mandible dusky. Iris pale yellow. Feet as in the adult. The upper part of the head blackish-grey, the hind neck, and the upper parts generally, of the same colour, but darker towards the rump; the edge of the wing and the outer secondaries greyish-white, the latter grey towards the end. The lower parts greyish-white.

Female from Dr. T. M. Brewer. Length to end of tail 19½ inches, to end of wings 17½, to end of claws 21¼; wing from flexure 7¾; tail 1¾; extent of wings 32¼; bill along the ridge 1$\frac{10}{12}$; tarsus 2$\frac{2}{12}$; hind toe $\frac{7}{12}$, its claw $\frac{11}{12}$; second toe 1$\frac{11}{12}$, its claw $\frac{3}{12}$; third toe 2$\frac{11}{12}$, its claw $\frac{5}{12}$; fourth toe 2$\frac{9}{12}$, its claw $\frac{3}{12}$.

The mouth is narrow, 9½ twelfths in width; the palate slightly convex, with two faint lateral ridges on each side; its anterior part extremely narrow, with three longitudinal ridges, the lower mandible still narrower, and deeply channelled. Tongue 1 inch 7 twelfths long, slender, tapering to a thin horny point, trigonal, as deep as broad, fleshy and concave above, horny beneath. Œsophagus, *a b c*, 10¾ inches long; its width uniformly ½ inch along the neck; the proventriculus, *b c*, however, is dilated to a very large ovate sac nearly 1½ inches broad, 1 inch 9 twelfths in breadth. The stomach, *c d e f*, is of enormous size, roundish, slightly compressed, 2¼ inches in diameter; its muscular coat reduced to a single series of large fasciculi; its tendons, *e*, circular, 9 twelfths in breadth; the epithelium thick, soft, longitudinally rugous. The proventricular glands are of a cylindrical form, the largest being ½ inch long, and 1 twelfth in breadth; they form a complete belt 1⅛ inches in breadth. The inner coat of the stomach is destitute of epithelium, being quite soft and smooth. The stomach, therefore, is in all respects similar to that of the truly piscivorous birds, such as Divers and Herons, and totally different in structure from that of the Coots, to which the Grebes might be supposed to be allied, on account of the structure of their feet. On the other hand, they differ from the Divers and Cormorants in the form of the œsophagus, which in these birds is extremely wide, whereas in the Grebes it is exceedingly contracted, and more resembles that of the Coots, Gallinules, and Rails. The proventriculus is intermediate between that of the birds just mentioned and the Cormorants. There is a pyloric sac of small size, approximating to that of the Pelican family. The stomach is moderately distended with a great quantity of feathers, apparently those of the bird itself or of some species of the same genus. These feathers are intermixed with vertebræ of small fishes, easily distinguishable by their concave surfaces and three prominent spines. The duodenum curves round the stomach, returning at the distance of 5½ inches, ascending to the liver as usual, passing down the right side, and forming several convolutions, the


a
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number of turns being twelve. Its length is 33 inches; its width ½ inch at the upper part, towards the rectum only 3 twelfths. The cœca are 2 inches long, 2 twelfths in breadth, uniform, unless at the base, where they are narrower; their distance from the extremity 3 inches. The cloaca is globular, 1½ inches in diameter.

The trachea is 9¼ inches long, of the nearly uniform width of 3¼ twelfths, unless at the lower part, when it is narrowed to 2 twelfths; flattened in its upper half, and compressed in the lower; the rings moderately firm, 180 in number. The Grebes differ from almost all other birds in having the bronchial rings complete and firmly ossified. In the present species, they are only 8 in number, the remaining part of the bronchi being membranous. There are the usual cleído-tracheal muscles; the sterno-tracheal, part of which is continuous with the lateral muscles, but the inferior portion distinct, and attached to several of the rings; there is also a single pair of inferior laryngeal muscles.

The jugular veins are of vast size, and toward the lower part of the neck form an immense dilatation; that of the left side being distended with coagulated blood to 9 twelfths of an inch, and so continuing until it enters the heart. The other is ½ inch in breadth. In this respect there seems to be an analogy to the diving mammifera, such as the seals and dolphins.

THE HORNED GREBE.

PODICEPS CORNUTUS, *Linn.*

PLATE CCCCLXXXI.—MALE AND YOUNG.

The period at which this little Grebe makes its first appearance, after the breeding season, on the waters of the Western States, such as the Ohio, the Mississippi, and their numerous tributaries, is the beginning of October, when I have seen them arriving and passing onward on wing at a considerable height in the air, following the course of the streams. The generally received idea that birds of this genus perform their migrations on the water, is extremely absurd. I have already offered some remarks on this subject, but as too much cannot be said, when an erroneous notion extensively

Horned Grebe

1. Adult Male. 2. Female in Winter

Drawn from Nature by J.J. Audubon F.R.S.F.L.S.

Lith.ª Printed & Col.ª by J. T. Bowen Phila.ª

adopted has to be disproved, I here repeat that I have seen flocks of Grebes on wing and migrating high in the air, apparently with as much ease as many longer-winged birds, and with considerable velocity.

Towards evening, on the 14th of October, 1820, I was floating in a small boat on the Ohio. The weather was perfectly calm, and I was startled by a whistling sound over head, resembling that of a Hawk stooping on its prey, when, on looking up, I saw a flock of Grebes, about thirty in number, gliding towards the water as if about to alight within a quarter of a mile from me. In a few minutes they had come within a few yards of the surface of the water, when suddenly checking their speed, they pursued their course until out of sight; but in a short time I saw them returning towards me, and in less than a minute they all passed at a distance of forty or fifty yards, took a round and alighted pell-mell. The next moment, they were all engaged in washing and trimming themselves, in the manner of Ducks, Cormorants, and other aquatic birds. As I rowed towards them, they scarcely took notice of me, so that they were easily approached; and finding a number of them close together, I fired and killed four. The rest paddled off for some yards, rose on wing, and flew down the stream in a pretty close body, looking as if not disposed to settle again for some time. On picking up the dead birds, I found them to be of the present species, three being young, the other an adult with the winter plumage beginning to appear. Here I may remark, that Grebes in general do not moult so early as most other birds after they have young; thus the Crested Grebe often passes to the south in September, with its head still adorned with a large portion of the feathers of its spring and summer tippet. While residing at different places on the Ohio, I have many times witnessed the passage of the Horned and the Crested.

The Horned Grebe is abundant during autumn and winter on the large rivers or inlets of the Southern States, but rare along the coasts of the Middle and Eastern Districts. On the rivers about Charleston in South Carolina it is seen at those seasons in considerable numbers, although not in larger flocks than from four to seven individuals. The same is observable from that place to the mouths of the Mississippi. It is particularly fond of those streams of which the borders are overgrown by rank sedges and other plants, and are subject to the influx of the tide. In such places they enjoy greater security while searching for their food than in ponds, to which, however, they for the most part retire at the approach of the pairing season, which commences early in February. At that time one might be apt to think that these birds could scarcely fly, as they are then rarely seen on wing; but when they are pursued, and there happens to be a breeze, they rise from the water with considerable ease, and fly to a distance of several

hundred yards. In December and January I have never procured any having the least remains of their summer head-dress; but by the 10th of March, when they were on their journey towards the north, the long feathers of the head were apparent. These tufts seem to attain their full development in the course of a fortnight or three weeks, the old birds becoming plumed sooner than the young, some of which leave the country in their winter dress.

On the ground, this species is not better off than the Dobchick, it being obliged to stand nearly erect, the hind part of the body resting, and the tarsi and toes extended laterally. They dive with great celerity, and when once acquainted with the effects of the gun are not easily shot. A report is at times sufficient to make the old birds dive at once, although they may be quite beyond the reach of a shot. The young birds are more easily procured at their first appearance; but the most efficient method of obtaining them is to employ fishing nets, in the meshes of which they become entangled.

Excepting a species of Hawk nearly allied to *Circus cyaneus*, I know of no other bird that has the eye of such colour, the iris being externally of a vivid red, with an inner circle of white, which gives it a very singular appearance. On attentively examining the eyes of our Divers and Grebes, I have not found any with similar eyes. The Horned Grebe does not seem to see better than any other species, nor does it appear to be more diurnal than the rest, nor are the objects on which it feeds more minute, for I have found as small seeds in the stomach of the large Grebe as in that of the present species. The reason of this strange colouring of the iris, therefore, I am unable to conjecture.

Although the greater number of these birds go far northward to breed, some remain within the limits of the United States during the whole year, rearing their young on the borders of ponds, particularly in the northern parts of the State of Ohio, in the vicinity of Lake Erie. Two nests which I found were placed at a distance of about four yards from the water's edge, on the top of broken down tussocks of rank weeds. The materials of which they were composed were of the same nature, and rudely interwoven to a height of upwards of seven inches. They were rather more than a foot in diameter at the base, the cavity only four inches across, shallow, but more neatly finished with finer plants, of which a quantity lay on the borders, and was probably used by the bird to cover the eggs when about to leave them. There were five eggs in one nest, seven in the other; all contained chicks (on the 29th of July); they measured one inch and three quarters in length, by one inch and two and a half eighths; their shell was smooth, and of a uniform yellowish cream colour, without spots or marks of any kind. The nests were not more than fifty yards apart, on the south-western side of the

pond. I am thus particular because of the near relation of this bird to the *Podiceps auritus* of LATHAM, with which it may be confounded by a not over-careful observer, as may the eggs too, those of the latter species being precisely of the same length, but fully an eighth of an inch narrower, which of course gives them a more elongated appearance. I have observed the same differences in the eggs of these two species in Europe. I could not ascertain if both the parent birds incubate; but as I saw two pairs on the pond, I am inclined to think that they do. The nets were not fastened to the weeds around them, nor do I conceive it probable that they could be floated, as various writers assert they are at times.

I have not seen the young of this species when small; but from the knowledge I have of those of other Grebes, I feel pretty certain that the notions entertained of their being carried either on the back or under the wings of their parents in cases of danger must be erroneous, as Grebes in all such cases dive or fly at once, when it would be impossible for the old and young to keep thus attached to each other.

I have observed in the stomachs of almost all that I have examined, a quantity of hair-like substances rolled together like the pellets of Owls, but have not ascertained whether or not these masses are disgorged. They certainly cannot pass through the intestines. But unless birds of this kind are kept in an aviary and watched, this matter must remain unknown. The food of this species, while on salt-water, is composed of shrimps, small fishes, and minute crustacea. While on fresh-water, they procure insects, leeches, small frogs, tadpoles, and aquatic lizards; they also pick up the seeds of grasses, and I have found as many in the stomach of an individual as would fill the shell of one of its eggs. Their flight is performed by regular short flappings, executed with great quickness.

I have represented an adult male in full spring plumage, and a young bird shot in December. The males are rather larger than the females, which are similar in colour, but rarely have the head so well feathered during the breeding season.

PODICEPS CORNUTUS, Bonap. Syn. p., 417.

PODICEPS CORNUTUS, *Horned Grebe*, Swains. and Rich. F. Bor. Amer., vol. ii. p. 411.

HORNED GREBE, or DOBCHICK, Nutt. Man., vol. ii. p. 254.

HORNED GREBE, *Podiceps cornutus*, Aud. Orn. Biog., vol. iii. p. 429; vol. v. p. 623.

Male, 14¾, 25½.

Very common during autumn on the Ohio, Missouri, Mississippi, and all their tributaries, as well as in all the Atlantic Districts, to Texas. Breeds from the Great Lakes to the Fur Countries. Migratory.

Adult Male in spring.

Bill shorter than the head, straight, acute, rather slender. Upper mandible with the dorsal line straight for one-half of its length, towards the end declinate and slightly convex, the ridge convex, the sides sloping, the edges sharp and inflected, the tip acute. Nasal groove broad, extending to beyond the middle of the mandible; nostrils sub-basal, linear-elliptical, pervious. Lower mandible with the angle long and very narrow, the dorsal line short, ascending, straight, the sides erect, slightly convex, the edges sharp, inflected, the tip narrow, acute.

Head of moderate size, oblong, compressed. Neck rather long and slender. Body depressed. Feet large, short, placed far behind; tibia feathered to the joint; tarsus short, extremely compressed, anteriorly with a narrow scutellate ridge, laterally with numerous broad scutella, posteriorly with a narrow ridge having a double row of small prominent scales. Hind toe very small, with an inferior small membrane; fore toes long, the outer longest, scutellate above, united at the base by short webs, externally margined, internally with broad rounded expansions, which are marked with parallel oblique lines, and crenate on the edges. Claws flattened, that of the middle toe broadest, with an extremely thin, broad terminal edge.

Plumage of the head and neck very soft and downy, of the breast and sides silky and highly glossed, of the abdomen downy, of the upper parts imbricated, but with loose edges. Wings small; primaries much curved, the first longest, the second almost equal. Tail, a small tuft of loose feathers. On the head, at this season, is a tuft of soft feathers on each side behind the eye, and a larger on each side of the upper part of the neck.

Bill bluish-black, its tip yellow. Short loral space bright carmine, as is the iris, its inner margin white; edges of eyelids greyish-blue. Feet dusky externally, internally and on the anterior and posterior ridges of the tarsus dull yellow; claws dusky. Forehead greyish-brown; upper parts of the head bluish-black, as are the sides, fore neck anteriorly, and the elongated ruff feathers; a broad band over the eyes, and the elongated tufts behind them yellowish-brown. Fore neck brownish-red; lower parts white, the sides reddish-brown: abdomen dull grey. The upper parts are brownish-black, the feathers edged with greyish, the middle secondary quills white.

Length to end of tail 14¾, to end of claws 19; extent of wings 25½; wing from flexure 5¾; bill along the back $\frac{11}{12}$, along the edge of lower mandible 1¼; tarsus 1¼; outer toe $1\frac{9}{12}$, its claw $\frac{3}{12}$. Weight 14 oz.

Young Female in winter.

The feathers of the hind head are a little elongated, but at this age there are no tufts on the head. In other respects the plumage is as in the adult male. The bill is bluish-grey, as is the bare loral space; the eye bright

carmine, the iris with an inner white edge ; the feet bluish-grey. The upper part of the head, and the hind neck, are greyish-black, as are the upper parts in general. The feathers of the back edged with light grey. The throat, the sides of the head, a broad patch on each side of the neck nearly meeting behind, and the breast white ; the sides and downy feathers of the abdomen brownish-grey. Some of the secondaries are white, as in the adult male.

Male. The mouth as in the last species, 4½ twelfths wide ; the tongue 11 twelfths long, and similar to that of the Red-necked Grebe. Œsophagus 7 inches in length, along the neck only 4 twelfths broad ; the proventriculus excessively large, ovate, 10 twelfths in breadth. The stomach is an enormous sac, 2 inches long, 1½ broad, a little compressed, of the same structure as in the last species ; its tendons 4 twelfths in breadth. There is a small flattened pyloric lobe. The contents of the stomach are feathers, and bones of fishes. There is in this species a very distinct, thick, soft, bright red, longitudinally rugous epithelium. The proventricular glands are of great size, the largest 3 twelfths long, 1 twelfth in breadth ; they form a belt 1¼ inches in breadth. The lobes of the liver are very large, the left 2 inches 4 twelfths long, the right 2 inches ; the gall-bladder oblong. The intestine forming 12 curves ; its length is 49 inches, its breadth at the upper part 5 twelfths, diminishing to 3 twelfths ; the cœca 2 inches long ; their greatest width 2 twelfths, their distance from the extremity 1 inch 9 twelfths. Cloaca globular, about 7 twelfths in width.

The trachea is 6¼ inches long, much flattened in its whole length, excepting half an inch at the lower part ; for half its length it is 2 twelfths in breadth, then enlarges to 3 twelfths, and finally diminishes to 1½ twelfths. The rings are 184, firm. The bronchi are slender, with the rings complete, ossified, 12 in number : the remaining part being membranous. The muscles as in the last.

The jugular veins are not enlarged in this species.

EARED GREBE.

PODICEPS AURITUS, *Lath.*

PLATE CCCCLXXXII.—ADULT AND YOUNG.

The specimens from which my figures of this species of Grebe have been taken, were lent me by my noble and kind friend the Right Honourable the Earl of DERBY, who received them from North America, where, as I am assured, it is not uncommon, although it has not been my good fortune to meet with it.

EARED DOBCHICK or GREBE, *Podiceps auritus*, Nutt. Man., vol. ii. p. 256.
EARED GREBE, *Podiceps auritus*, Aud. Orn. Biog., vol. v. p. 108.

Adult ♂, wing $5\frac{8}{12}$.

Very rare, and not found by me in America.

Adult Male.

Bill shorter than the head, as broad as high at the base, compressed and slightly recurved toward the end; upper mandible with the dorsal line straight and slightly declinate to beyond the nostrils, then direct, but slightly descending toward the tip, the ridge convex, the edge incurved, the tip acute; lower mandible with the angle long and extremely narrow, the dorsal line beyond it ascending and slightly convex, the sides sloping outwards and a little convex, the edges direct, the tip acute. Nostrils linear, basal, rather small, pervious. Gap-line almost straight, being a little recurvate.

Head of moderate size, oblong, compressed; neck long, slender; body depressed. Feet short, large, placed close to the extremity of the body; tibia feathered to within two-twelfths of an inch of the joint; tarsus extremely compressed, its anterior edge with a row of small scutella, the sides with broad scutella, beyond which are some irregular scales, the posterior edge with a double line of small prominent scales; first toe very small, with an inferior membrane, fourth longest; anterior toes scutellate, connected at the base by a membrane, and having on both sides an expanded web-like margin, marked with oblique lines, and having a crenulate edge; claws flat, that of the third toe very broad, obliquely obovate, abrupt.

Plumage very soft, blended, on the lower parts silky, on the back glossy

Eared Grebe

1. Male 2 Young first Year

Drawn from Nature by J.J. Audubon FRSFLS. Lith.ed Printed & Col.d by J.T. Bowen Philad.a

and rather compact. Feathers on the occiput a little elongated; a tuft of very long, loose, linear feathers on each side of the head, rising from over and behind the eye, and covering the ears. Wings small, acute; primaries much curved, the first longest, the second almost equal, the rest rapidly graduated; secondaries short, rounded. Tail a slight tuft of loose feathers.

Bill black, tinged with blue. Iris blood-red. Feet dusky-grey externally, greenish-grey on the inner side. The tufts on the sides of the head are orange, anteriorly more yellow, posteriorly red; the head and upper part of the neck are deep black; the rest of the upper parts brownish-black, the wings greyish-brown, with a broad patch of white, the secondary quills being of that colour. The throat, fore part and sides of the neck are dull black, its lower part with some spots of the same; the rest of the lower parts glossy silvery-white, excepting the sides of the body and rump, which are light red.

Length to end of tail 13 inches; bill along the ridge $\frac{1}{12}$, along the edge of lower mandible $1\frac{1}{12}$; wing from flexure $5\frac{8}{12}$; tarsus $1\frac{6}{12}$; hind toe and claw $\frac{5}{12}$; second toe to the end of the claw $1\frac{8}{12}$; third toe 2; fourth toe $2\frac{1}{4}$.

Young in autumn.

In this state the tufts of the head are not developed, and the feathers of the neck are softer. The bill is greyish-blue, dusky above; the feet as in the adult. The upper parts are brownish-black, the neck tinged with grey behind; the secondary quills are white; the throat and a broad band, curving beneath the ear so as almost to meet the other on the nape, greyish-white; the neck brownish-grey all round at its upper part; the lower parts silvery-white, the sides of the body and rump tinged with dusky-grey.

THE PIED-BILLED DOBCHICK.

PODICEPS CAROLINENSIS, *Lath.*

PLATE CCCCLXXXIII.—MALE AND FEMALE.

There go the little Dobchicks, among the tall rushes and aquatic grasses that border the marsh. They have seen me, and now I watch them as they sink gently backwards into the deep water, in the manner of frightened frogs. Cunning things! "Water-witches," as they call you, I clearly see your bills, although you have withdrawn all of you save those parts, and sneak off towards yon great bunch of bulrushes. Well, speed on, and may safety attend you! Nature has granted you means of eluding your enemies, and I am heartily glad to see that you have profited by her instructions. I know you can fly too. How happy must you be, to be thus enabled to migrate through the air, instead of being obliged to labour for months with your curiously scolloped feet, in removing from one country to another, as *authors* say you do. Ah! you have reached a small secluded pool, where you intend to breed in peace and security; there you are, collecting rushes and weeds to form a large matted bed, on which you intend to deposit your pearly eggs. Labour on, mind me not, I am a true friend and admirer of your race. I see that among these plants you have fixed your tenement, in which there will soon be five eggs, which, although tinged with green, will look as if pure white. I wish I knew how many days of constant heat from your bodies it will require to hatch them. Some other time perhaps you may tell me. Miniatures of yourselves I now see swimming gaily, skipping, springing, gliding, dipping, just like yourselves. So, you snatch the crawling bug, and gorge yourselves with leeches, fish, and herbage. How fast your young ones grow, changing from downy to hairy, and again to feathery and silky. On winglets they now cross the clear pool, and crawl on the opposite shore, there enjoying the warmth of the bright sunbeams. September has come; plump and strong seven of you there are; the evening is calm and beautiful; you spread out your wings, reach with some difficulty a proper height, and swift as meteors glide through the air, until, meeting with warmer waters, you alight on them, and there remain for a season.

The Pied-billed Dobchick may be met with in almost every part of the United States, at one season or other: in the south and west during autumn

2 W.E.H. 1

Pied-billed Dobchick.

Drawn from Nature by J.J. Audubon F.R.S.F.L.S.

1. Male. 2. Female.

Lith.ª Printed & Col.ª by J. T. Bowen Phila.ª

and winter, in the east and north-west in spring and summer, mostly on fresh waters of all descriptions, yet when these are covered with ice, on bays and estuaries, where it searches for shrimps and fry, although under other circumstances such haunts are not congenial to it. It is found in New Brunswick and Nova Scotia, but I did not meet with it in Labrador or Newfoundland.

I had the good fortune, on the 28th of June, to stumble upon a nest of this bird near the banks of the Wabash river, above Vincennes. It was large for the bird, raised several inches above the muddy and reedy shores of a pond, only a few feet from the water, and composed of decayed weeds, rushes, and earth. On being discovered, the sitting bird slid over the mud, along a path that led directly to the water, in which it immediately dived, and I saw no more of it for about twenty minutes. The eggs, which were five, measured an inch and a quarter, by seven and a half-eighths, were smooth, rather rounded, and of a light greenish-white colour. On breaking one of them, I found it to contain a chick considerably advanced, which induced me to leave the rest untouched, and before I departed I saw the bird, which I believed to be the female, swimming low at a distance. I watched it for some time, but could not discover another, and walked away to allow it to resume its occupation. The nest was fixed among the stalks of strong reeds, but was not attached to any of them. In the month of August, while on the Cayuga lakes, I saw one of these birds with a brood of young about half grown, but could not obtain a single specimen, as they dived with extreme quickness, and eluded all pursuit.

Few birds plunge with more rapidity than this species, which, during submersion, employs its wings, as I had an opportunity of observing while some were passing under a boat when I was in pursuit of them. On the water it is almost impossible to catch them, unless they have been injured in the wing, when they are unable to dive without difficulty. The curious habit which they have of sinking gradually backward in the water, at the sight of an enemy, is very pleasing to observe. Not a ripple do they leave on the spot where they have disappeared, and one unacquainted with them can hardly conceive that a bird could have escaped in so dexterous a manner. My friend THOMAS MACCULLOCH gave me an account of one which, having been observed on a small mill-dam, was pursued by the miller's sons, who, after chasing it fully an hour, could not even drive it on shore. Their father, however, who was as anxious as themselves to see the curious creature, drained the pond, when the little thing was seen crawling over the mud in a manner not unlike that of a turtle. It was now easily caught, as it was not able to rise on wing, the species, it seems, being incapable of spring-

ing from the ground, and was afterwards given to my young friend, who presented it beautifully prepared to me.

While I was at Philadelphia, my learned and staunch friend the late Dr. RICHARD HARLAN, received two Pied-billed Grebes alive, which had been caught in a fishing-net on Brandywine creek. We placed them in a large tub of water, where we could see all their subaqueous movements. They swam round the sides of the tub in the manner of the Puffin, moving their wings in accordance with their feet, and continued so a much longer time than one could suppose it possible for them to remain under water, coming up to breathe, and plunging again with astonishing celerity. When placed on the carpet, they ran awkwardly half erect, for a distance of a few feet, tumbled over, and scrambled along with the aid of their wings. Nothing could induce them to eat, and after a day or two of captivity, the little creatures were taken to the Delaware, and set at liberty.

This bird retires to rest on the floating beds of rushes met with in ponds, or on the edges of the shores; and in such places you may see it sitting upright, and dressing its plumage in the sunshine. They are extremely unwilling to rise on wing, unless during their migrations, or when chasing each other at the pairing season, which commences in March, when they manifest a good deal of pugnacity. On such occasions, the males fly, dive, and rise again on wing, in the manner of the Foolish Guillemot. While travelling, they pass rapidly through the air, at times at a considerable elevation, when the movements of their wings produce a sound like that of a Hawk stooping on its prey. They are seldom found in parties of more than six or seven. The idea of migrating by water is quite absurd. How long would it take a Dobchick to swim from the mouths of the Mississippi to the head waters of the Ohio; and when arrived there, after six or seven weeks of constant paddling, how is he to proceed farther? Yet it is well known that they breed farther north, and are general on the southern waters early in October.

The food of the Pied-billed Dobchick consists of small fry, plants, seeds, aquatic insects, and snails; along with which they swallow gravel.

They seem to form particular attachments to certain ponds or small lakes, where, until they are closed by ice, you may always observe a pair or a family. Opposite Henderson I regularly saw a couple every autumn, and my friend the Reverend JOHN BACHMAN has observed a group of them for many winters in a small pond a few miles distant from Charleston. They seem to have a dislike to swift-running streams, and when on them keep to the eddies along the shores. The curious double pectination on the hind part of their tarsi, seems to aid them greatly while sitting upright on the broad leaves of water-lilies, on the surface of which I have observed indented

impressions after the birds had plunged into the water from them. The young differ in colour from the adult, but the old males and females resemble each other, only the former are larger.

PODICEPS CAROLINENSIS, Bonap. Syn., p. 418.

PODICEPS CAROLINENSIS, *Pied-bill Grebe*, Swains. and Rich. F. Bor. Amer., vol. ii. p. 412.

PIED-BILL DOBCHICK, *Podiceps carolinensis*, Nutt. Man., vol. ii. p. 259.

PIED-BILL DOBCHICK, *Podiceps carolinensis*, Aud. Orn. Biog., vol. iii. p. 359; vol. v. p. 624.

Male, 14, 23.

Extremely common in autumn on all our Western streams, as well as those of the Atlantic Districts. In winter in the Southern States, as far as Texas. Breeds on the Wabash, and other streams of the interior, to Maine. Migratory.

Adult Male.

Bill shorter than the head, stout, deep, compressed, tapering. Upper mandible with the dorsal line nearly straight at the base, curved towards the end, the ridge slightly flattened for a short space at the base, narrow in the rest of its extent, the sides convex towards the end, the edges sharp, inflected, the tip obtuse, a little decurved. Nasal groove broad, and extending beyond the middle of the mandible; nostrils elliptical, lateral, sub-medial, pervious. Lower mandible with the angle long and narrow, the sides nearly erect, but convex, the dorsal line very short and sloping upwards, the edges inflected, the tips narrow, the gap-line nearly straight.

Head rather small, oblong, compressed; neck rather long; body depressed. Feet placed far behind, short, stout; tibia bare for a very short space below; tarsus short, much compressed, thin before and behind, anteriorly scutellate, on the sides with large scutelliform scales, posteriorly rough, with a double row of very small scales. Hind toe very small and situated high; fourth toe longest, third a little shorter, second much shorter; anterior toes connected by webs, which beyond the second joint are slit and rounded, the outer edges of the second and fourth furnished with broad lobed membranes; the lobes are marked with parallel grooves, directed a little forwards. Claws of fore toes depressed, that of middle toe resembling a human nail.

Plumage blended, on the forehead with stiff enlarged shafts, as in the Rails, on the back shining and rather hard, as well as on the lower part of the neck anteriorly and laterally, on the rest of the lower parts glossy and hair-like. Wings very small; primary quills curved, the second longest, first slightly shorter, third longer than first; secondary short, broad, rounded. the inner elongated and more tapering. Tail a slight tuft of loose feathers

Bill pale blue, upper mandible dusky along the ridge, and with the lower

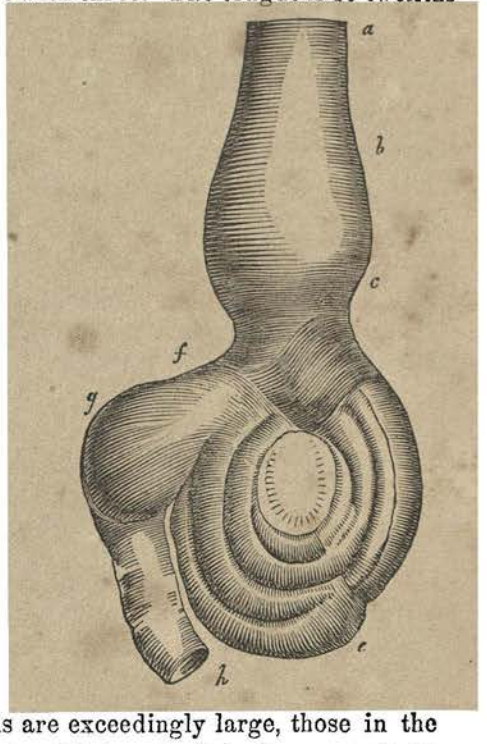
having a black spot beyond the middle. Iris brown. Feet greyish-black. Upper part of the head and the throat black; neck and sides of the head light greyish-brown, the stiff edges of the feathers on the lower part and sides of the neck greyish-yellow; back brownish-black, as are the inner secondaries; the outer light brown, with a reddish-white spot on the end of the inner web; primaries light brown, dusky at the end. The breast is silvery-white, the abdomen brownish-grey, and the sides mottled with the same.

Length to end of tail 14 inches, to end of wings 12, to end of claws 18; extent of wings 23; wing from flexure $4\frac{0}{12}$; bill along the ridge $\frac{1}{12}$; along the edge of the lower mandible $1\frac{4}{12}$; tarsus $1\frac{5}{12}$; middle toe 2, its claw $\frac{4}{12}$. Weight 15 oz.

Adult Female.

The female wants the black band on the bill; but is in other respects nearly similar to the male. Weight 13 oz.

Male. Mouth 7 twelfths wide; the palate flat, with two longitudinal ridges on each side; the anterior part with three. The tongue is 10 twelfths long, slender, slightly concave above, trigonal, tapering to a thin horny point. Œsophagus 8 inches long, $\frac{1}{2}$ inch in width along the neck. The proventriculus, *b c*, forms a very large sac, as in the other species, 10 twelfths in width; but the stomach, *c d e f*, although still very large, is more muscular in structure, and approaches in character to a true gizzard. It is of an irregularly elliptical form, $1\frac{3}{4}$ inches long, $1\frac{1}{4}$ inches broad; there are distinct lateral muscles 5 twelfths thick, a very prominent inferior muscle, *e*, and large oblong tendons. The epithelium is very thick, dense, tough, with remarkably strong longitudinal rugæ, transversely fissured, and also lining the large pyloric cavity, *f*, which is 8 twelfths in extent. The proventricular glands are exceedingly large, those in the middle being 3 twelfths long, and $\frac{1}{4}$ twelfth broad; they form a belt $1\frac{1}{4}$ inches in breadth. The intestine forms 8 folds, and measures 31 inches in length; its width at the upper part is $3\frac{1}{4}$ twelfths, at the lower 3 twelfths.



The cœca are only 3 twelfths long, and 1 twelfth broad. The cloaca is globular, and of moderate size.

The trachea is 5 inches 10 twelfths long, much flattened; 1¾ twelfths in breadth, toward the lower parts 2 twelfths, and lastly contracted to 1½ twelfths; the rings 150. The bronchi differ in this species from the rest in being composed of distinctly separated cartilaginous half rings, 15 in number. The muscles as in the other species.

In another individual, a female, the stomach is of a regularly elliptical form, 1 inch 9 twelfths long, 1¾ inches in breadth; the muscular coat of moderate thickness, composed of strong fasciculi; the epithelium thinner and more corrugated. The stomach contains a great quantity of feathers, scales of fishes, numerous elytra of aquatic coleoptera, and a fish 3 inches long, and 11 twelfths in depth.

It is very remarkable, and equally singular, that all the Grebes should have the stomach distended with feathers. These bodies being indigestible, and not the remains of objects devoured, for none of these birds prey upon birds, must be swallowed for the purpose of aiding digestion; but in what manner they accomplish this object is not easily determinable. They may keep the stomach distended by their elasticity, but why should that organ require to be more so than that of the Divers, which live on the same sort of food?

NEW SPECIES.

NOT IN MY SYNOPSIS.

During my journey to the country around and about the waters of the Upper Missouri and Yellow Stone rivers, in the summer and autumn of 1843, my companions and myself had the good fortune of procuring several new species of birds; and I feel much satisfaction in presenting them to my subscribers, who, I trust, will be gratified to see that my anxiety to please them is not in the least diminished.

In publishing these new species, I have the gratification of naming some of them after those gentlemen who accompanied me on my late tour; and others, after friends connected with the science of ornithology, publicly or otherwise.

With the exception of a few of these birds, procured in the bottom lands along the Missouri river, they all were found on the sterile prairies, which form the greater portion of the country visited by us; and generally during our excursions after the buffalo, the elk, or the antelope.

I shall also give figures of two or three species discovered by others, within the range proposed to be included in my synopsis as appertaining to our Fauna. In the accounts given of these new species, the student will be surprised as much as I have myself been, to see how closely allied most of them are to species long since described, not only by me, but even by ALEXANDER WILSON, NUTTALL, and CHARLES LUCIEN BONAPARTE. I have a series of each species now in my possession, which can be seen by any student of ornithology who may desire to examine them.

WEH

Harris' Finch.

1. Adult Male 2. Young Female.

Drawn from Nature by J.J. Audubon FRSFLS

Lith.d Printed & Col.d by J. T. Bowen Phila.d

FAMILY XV.*—FRINGILLINÆ. FINCHES.

GENUS IX.†—FRINGILLA, *Linn.* FINCH.

HARRIS' FINCH.

FRINGILLA HARRISII, *Aud.*

PLATE CCCCLXXXIV.—MALE AND YOUNG.

The discovery of this beautiful bird is due to my excellent and constant friend EDWARD HARRIS, Esq., who accompanied me on my late journey to the Upper Missouri river, &c., and after whom I have named it, as a memento of the grateful feelings I will always entertain towards one ever kind and generous to me.

The first specimen seen, was procured May 4th, 1843, a short distance below the Black Snake Hills. I afterwards had the pleasure of seing another whilst the steamer Omega was fastened to the shore, and the crew engaged in cutting wood. This was on the west side of the river, at a place lately occupied by Indians engaged in making maple sugar. The country was hilly, the timber large, and the abandoned camp of a party of Indians, proved to us that game was abundant in the neighbourhood, as we saw the remains of Deer, Wild Turkeys, and Pigeons strewed around the hut, where the pots and kettles of these sons of the forest had manufactured the sugar.

As I was on the look-out for novelties, I soon espied one of these Finches, which, starting from the ground only a few feet from me, darted on, and passed through the low tangled brushwood too swiftly for me to shoot on the wing. I saw it alight at a great distance, on the top of a high tree, and my several attempts to approach it, proved ineffectual; it flew from one to another tree-top as I advanced, and at last rose in the air and disappeared. During our journey up the stream my friend HARRIS, however, shot two others, one of which proved a female, and another specimen was procured by Mr. J. G. BELL, who also was one of my party. Upon our return voyage, my friend HARRIS had the good fortune to shoot a young one, supposed to

* See vol. iii. p. 49. † Ibid p. 138.

be a female, near Fort Croghan, on the 5th of October, which I have figured along with a fine male. The female differing in nothing from the latter.

All our exertions to discover the nest of this species were fruitless, and I concluded by thinking that it proceeds further northward to breed.

HARRIS' FINCH, *Fringilla Harrisii*, Aud.

Male $7\frac{1}{8}$, $10\frac{7}{16}$.

Found on the Upper Missouri. Not abundant.

Adult Male.

Bill dusky; head and throat black, descending by streaks of the same colour on the breast. Cheeks and a broad line nearly meeting on the nape, ash-grey; back dull bay, streaked with brownish-black; rump dull olivaceous; edge of wing whitish. Two bands of white on the wings, formed by the tips of the secondary coverts and first row of small coverts. Tail feathers brown, edged with light greyish-olive. Sides of the breast thickly streaked with black dots. The lower parts white, tinged with light brownish-yellow. Legs dusky, the claws darker. Second quill longest.

Bill along the ridge $\frac{1}{2}$ inch, along the gap $\frac{5}{8}$; from bill to pinion $1\frac{5}{8}$; to end of wing 5 inches, to end of claws $6\frac{1}{8}$, to end of tail 7; alar extent $10\frac{7}{16}$; wing from flexure $3\frac{7}{16}$; tarsus $\frac{7}{8}$; middle toe $\frac{5}{8}$, its claw $\frac{1}{4}$; hind toe $\frac{2}{8}$, its claw $\frac{3}{8}$. Feet cinnamon colour.

Young, supposed to be a Female.

The general appearance is the same as the above, as well as the colouring, except that the upper part of the head is covered with black feathers, each edged with yellowish-brown, as well as the sides of the head. A streak of black descends from the base of the lower mandible, and the upper parts of the breast and sides are thickly streaked with deep brownish-rufous; lower parts as in the adult; measurements the same. The adult female exactly as in the male.

Bell's Vireo.

Male

Rattle-snake Root.

Drawn from Nature by J.J.Audubon,F.R.S.F.L.S.

Lith.d Printed & Col.d by J. T. Bowen. Phila.a

FAMILY XX.*—VIREONINÆ. GREENLETS.

GENUS I.†—VIREO, *Viell.* GREENLET.

BELL'S VIREO OR GREENLET.

VIREO BELLII, *Aud.*

PLATE CCCCLXXXV.—ADULT MALE.

On the same day that Harris' Finch was procured, Mr. J. G. BELL, who, as I have already said, accompanied me in my journey to the Yellow Stone river, &c., shot one of the species which I am now about to describe, and which I have named, it being also a new and hitherto undescribed species, with great pleasure, after Mr. BELL; the more especially as Mr. BELL is himself a person who possesses a good general knowledge of our birds, and was an excellent companion in our not unperilous rambles.

This species, like other Vireos of the smaller class, is usually found in the bottom lands along the shores of the Upper Missouri river, from the neighbourhood of the Black Snake Hills as far as we went up that river; finding it in many instances, whether in the bottom lands, overgrown with low shrubbery, or along the borders of ravines that discharge the water accumulating during the spring meltings of the snows that cover the upper country prairie land. In its habits it is probably more nearly allied to the White-eyed Vireo (*V. noveboracensis*) than to any other; as although it does not possess all the swiftness of movement and quaint look exhibited by that species, still it evinces all the movements usually observable in birds of this family.

We never found its nest, although it doubtless breeds in the countries which we traversed; as on many occasions, and during the very heat of summer we found it as far up the Missouri river as Fort Union, one of the principal and handsomest factories of the American Fur Company

BELL'S VIREO or GREENLET, *Vireo Bellii*, Aud.

* See vol. iv. p. 140. † Ibid.

$4\frac{11}{16}$. $6\frac{11}{16}$.

Shores and prairies of the Upper Missouri, and probably found on all streams of the Western Territories.

Male.

The upper parts are light greyish-olive, tinged with grey on the head and shoulders. Wings and tail brown, edged with yellowish-olive. The lower parts and sides of the neck tinged with yellow, which increases in depth on the sides, including the inferior tail coverts.

Bill along the ridge $\frac{8}{8}$ inch, along the gap $\frac{1}{2}$, to end of tail $4\frac{11}{16}$ inches; alar extent $6\frac{11}{16}$; wing from flexure $2\frac{1}{4}$; tail $1\frac{3}{4}$. Sides brown. Tarsus $\frac{8}{8}$ inch; middle toe $\frac{8}{8}$, its claw rather more than $\frac{1}{8}$; hind toe $\frac{4}{8}$, its claw $\frac{11}{8}$.

Bill and feet bluish-grey, lower mandible paler. Third quill longest. Female a trifle smaller, but resembling the male in every other respect.

FAMILY XIV.*—ALAUDINÆ. LARKS.

GENUS I.†—ALAUDA, *Linn.* LARK.

SPRAGUE'S MISSOURI LARK.

ALAUDA SPRAGUEII.

PLATE CCCCLXXXVI.—MALE.

The first specimen of this truly interesting Lark, was procured by Mr. ISAAC SPRAGUE, another of my companions, who shot it on the 19th of June, 1843, near Fort Union, Upper Missouri.

On several occasions my friend EDWARD HARRIS sought for these birds on the ground, deceived by the sound of their music, appearing as if issuing from the prairies which they constantly inhabit; and after having travelled to many distant places on the prairie, we at last looked upwards, and there saw several of these beautiful creatures singing in a continuous manner, and soaring at such an elevation, as to render them more or less difficult to

* See vol. iii. p. 43. † Ibid. p. 44.

Sprague's Missouri Lark.

Male.

Drawn from Nature by J.J.Audubon F.R.S.F.L.S.

Lith.d Printed & Col.d by J. T. Bowen Philad.a

discover with the eye, and at times some of them actually disappearing from our sight, in the clear thin air of that country.

On the ground they run prettily, sometimes squatting to observe the movements of the intruder, and at times erecting their body fronting the pursuer. After procuring a good number of them, our anxiety about discovering their nest was relieved by Mr. SPRAGUE, who brought us one containing five eggs; and afterwards we procured several young fully fledged.

On first rising from the ground they fly in so deep and undulating a manner, as almost to preclude their being shot on the wing; and this they continue to do, forming circles increasing in extent until about one hundred yards high, when they begin to sing, and continue to do so for fifteen or twenty minutes at a time, and then suddenly closing their wings, they glide down on the prairie below. We had not been long in chase, ere we discovered that they could be approached much easier by riding after them in a small wagon, and on several excursions we all procured specimens. Sometimes when rising from the ground, as if about to sing, for some forty or fifty yards, they suddenly pitch downwards, alight, and run or squat, as already mentioned.

The nest of this species is placed on the ground and somewhat sunk in it. It is made entirely of fine grasses, circularly arranged, without any lining whatever.

The eggs, which usually are four to five in number, average seven-eighths of an inch in length by five-eighths in breadth, are smooth and dotted minutely all over, giving them a general greyish-purple hue. The young, after being hatched, follow the parents on the ground, and are fed with the smaller seeds of grasses, and gradually with insects, &c. They were already found in loose small flocks of eight to a dozen before we left Fort Union on the 16th of August, and some had begun their migrations southward, as well as many other species of birds.

SPRAGUE'S MISSOURI LARK, *Alauda Spragueii*, Aud.

6, 10½.

Found on the prairies near Fort Union. Habits somewhat similar to the European Sky-lark. Abundant.

Adult Male.

All the upper parts are light reddish-brown, streaked with blackish-brown; the fore neck pale yellowish, streaked around the upper part of the breast with elongated brownish-spots. Sides deeper, or nearly reddish-brown. Second primary longest, the first rather longer than the third. Secondaries nearing the end of the primaries to within three and a half eighths of an

inch; all the outer veins delicately edged with white. Tail emarginate, two inches and one-eighth in length, with the outer feather on each side white. The second white also, but having a longitudinal line of brownish-black on the inner side reaching nearly the whole length.

Bill along the ridge $\frac{31}{6}$ inch, brownish above, pale below; along the edge $\frac{3}{4}$, to pinion $1\frac{9}{16}$; wing from flexure $3\frac{1}{8}$; bill to end of tail 6, to end of claws $6\frac{5}{16}$; alar extent $10\frac{1}{4}$; tarsus $\frac{7}{8}$; middle toe $\frac{5}{8}$, its claw $\frac{1}{4}$; hind toe $\frac{1}{2}$, its claw $\frac{1}{2}$. Legs, feet and claws light yellowish flesh-colour, and transparent.

The female is very little smaller and precisely like the male. The young when fully fledged resemble the parents, but have all the upper plumage more distinctly marked.

FAMILY XV.*—FRINGILLINÆ. FINCHES.

GENUS I.†—PLECTROPHANES, *Meyer*. LARK-BUNTING.

SMITH'S LARK-BUNTING.

PLECTROPHANES SMITHII, *Aud.*

PLATE CCCCLXXXVII.—MALE.

This species was discovered by my companions, EDWARD HARRIS and J. G. BELL, during an excursion on the prairies of Illinois, in the vicinity of Edwardsville. Several specimens were procured by those gentlemen, and the following account of its habits has been handed to me by Mr. BELL. He says—

"We found these birds very abundant on the low prairie, near a lake in Illinois, about seven or eight miles distant from Edwardsville, whilst engaged in shooting Ducks, Geese, and American Snipes. They were generally in large flocks, and when on the ground they at once began to scatter and divide themselves, rendering it difficult for us to kill more than two at one shot; they run very nimbly, and in a manner resembling that of the Bay-

* See vol. iii. p. 49. † Ibid.

Smith's Lark Bunting?

Drawn from Nature by J.J.Audubon FRSFLS

Adult Male

Lith.ª Printed & Col.ª by J.T.Bowen Phila.ª

winged Bunting (*Emberiza graminea*), when they arose, which they seldom did until very nearly approached. They utter a sharp *click*, repeated several times in quick succession, and move off with an easy undulating motion for a short distance, and alight very suddenly, like many other birds of this family; seeming to fall as it were perpendicularly for several feet to the ground. They seemed to prefer the spots where the grass was shortest. When a single one arose it would fly a short distance and realight; but if three or four started together, the remainder became alarmed, and the whole flock (sometimes containing several hundreds) would start simultaneously. When in the air they flew in circles to and fro for a few minutes, and again alighted. We could see the white spot on the wing, either when they were on the ground or on the wing.

We could see them much better among the grasses whilst on horseback, and seldom saw them on the wing unless disturbed; and when in the air they kept up a constant chirping or call, somewhat resembling that of the Little Red Poll; and very frequently a couple would separate themselves from the great flock, and would pursue one another as if in play or with the desire to fight, and again return to the main body. It was too early in the season and no nests were found; indeed it is probable that this species removes far to the north to breed.

I have honored this species with the name of my good friend GIDEON B. SMITH, Esq., M. D., of Baltimore, Maryland, who has done much for science in several of its departments.

SMITH'S LARK-BUNTING, *Plectrophanes Smithii*, Aud.

6⅛.

Prairies of Illinois, &c. Very abundant.

Male in April.

All the upper parts are light dull yellowish-brown, streaked with brownish-black. A medial line on the head, another over the eye, with the cheeks and whole lower parts, of the same dull yellowish-brown as the upper surface, streaked on the breast and along the sides with brownish-black. A large patch of white occupies the pinion of the wing, and the smaller coverts are marked with black surrounded by white, forming a second row of white. All the quills are brownish-black, edged with white or whitish, the second and third quills are longest. Tail as the back and wings, excepting two feathers outside that are white, with a streak of brownish-black on the outer vein, and a broader one of the same colour on the inner; and this is conspicuous when the bird is on the wing. Bill and feet brownish-black, the feet darker as well as the claws. Eyes brown.

Whole length 6⅛ inches; tail 2½; wing from flexure 3¼; bill along the

ridge $\frac{6}{8}$, along the gap $\frac{1}{2}$; tarsus $\frac{7}{8}$; middle toe $\frac{5}{8}$, its claw $\frac{1}{8}$; hind toe $\frac{6}{8}$, its claw $\frac{3}{8}$.

No difference appears at this season in the sexes.

FAMILY XV.*—FRINGILLINÆ. FINCHES.

GENUS II.†—EMBERIZA, *Linn.* BUNTING.

LE CONTE'S SHARP-TAILED BUNTING.

EMBERIZA LE CONTEII, *Aud.*

PLATE CCCCLXXXVIII.—MALE.

Although we procured several specimens of this pretty little Sharp-tailed Finch, I have at present only one by me, a fine male, however, shot by Mr. J. G. BELL, of New York, on the 24th of May.

At first sight one might easily mistake it for the Henslow Bunting, but on comparing these two species, not only are distinct characters easily observed, but the localities wherein the present species is found are different, as well as its curious notes and general habits of keeping only among the long green slender grasses that here and there happen to grow in patches of less or greater extent along the margins of creeks found in the different parts of the prairies through which we passed, whilst in the pursuit of the buffalo or bison.

So closely does it keep in the coverts which it resorts to, that it is difficult to force it to rise on the wing, when only it can be procured. Its song is sharp, shrill, and of a querulous nature. We never could find its nest or young, and cannot give any further accounts of its habits.

I have named this interesting species after my young friend Doctor LE CONTE, son of Major LE CONTE, so well known among naturalists, and who is, like his father, much attached to the study of natural history.

LE CONTE'S SHARP-TAILED BUNTING, *Emberiza Le Conteii*, Aud.

* See vol. iii. p. 49. † Ibid. p. 58.

Le Conte's Sharp-tailed Bunting.

Male.

Drawn from Nature by J.J. Audubon, FRSELS. Lith.d Printed & Col.d by J. T. Bowen. Philad.a

Missouri Meadow Lark.

Male.

Drawn from Nature by J. J. Audubon, F.R.S.F.L.S. Lith.d Printed & Col.d by J. T. Bowen, Phila.a

$4\frac{5}{8}$.

Upper Missouri prairies. Common.

Male.

Bill much more slender than in *Emberiza Henslowii* (AUD.); first quill the longest, the rest diminishing rapidly. Tail emarginate and rounded, with the feathers acute. Upper parts light yellowish-red, streaked with brownish-black, the margins of the feathers and scapulars pale yellowish-white. Tail feathers dusky, margined with light yellowish. Lower parts, with the cheeks and a broad band over the eyes, fine buff. Medial line yellowish-white. The buff extending to the femorals and along the sides, streaked with brownish-black; throat, neck, and upper parts of the breast without any streaks, and plain buff.

Total length $4^{5}\frac{1}{8}$ inches; wing from flexure $2\frac{1}{8}$; first quill longest; tail $1\frac{7}{8}$; bill along the ridge $\frac{3}{8}$, along the edge nearly $\frac{1}{2}$; both mandibles dark blue, lighter along the edges. Eyes brown. Legs, feet and claws, dull flesh colour. Tarsus $\frac{1}{8}$; middle toe $\frac{1}{2}$, its claw $\frac{1}{8}$; hind toe $\frac{3}{8}$, its claw rather more than $\frac{1}{4}$.

FAMILY XVII.*—STURNINÆ. STARLINGS.

GENUS I.†—STURNELLA, *Vieill.* MEADOW-STARLING.

MISSOURI MEADOW-LARK.

STURNELLA NEGLECTA, *Aud.*

PLATE CCCCLXXXIX.—MALE.

Although the existence of this species was known to the celebrated explorers of the west, LEWIS and CLARK, during their memorable journey across the Rocky Mountains and to the Pacific, no one has since taken the least notice of it.

These travellers mention it at page 236 of the first volume, edited by PAUL ALLEN, Esq., and revised by ARCHIBALD M'VICAR. They say, on the 21st of June, 1805, "There is also a species of Lark, much resembling the

* See vol. iv. p. 69. † Ibid.

bird called the Old Field Lark, with a yellow breast and a black spot on the croup. * * * * The beak, too, is somewhat larger and more curved, and the notes differ considerably." The expedition was, at the period mentioned, in the neighbourhood of the great Falls of the Missouri.

We found the species quite abundant on our voyage up the Missouri, above Fort Croghan, and its curious notes were first noticed by Mr. J. G. BELL, without which in all probability it would have been mistaken for our common species (*Sturnella Ludoviciana*). When I first saw them, they were among a number of Yellow-headed Troupials, and their notes so much resembled the cries of these birds, that I took them for the notes of the Troupial, and paid no farther attention to them, until I found some of them by themselves, when I was struck with the difference actually existing between the two nearly allied species.

In their flight, manners on the ground, and general habits, nothing different from *S. Ludoviciana* could be observed; but on comparing the Missouri Meadow Lark with specimens of *S. Ludoviciana*, procured near New York, the differences are quite sufficient to warrant me to describe the former as a new and hitherto undescribed species. The bill of the Missouri Meadow Lark is more curved, and considerably narrower, than in the common species, indeed it is scarcely more than one half the breadth of the bill of the latter. The Missouri Lark is also considerably smaller; but the greatest difference is in the form of the tail, which in this species is nearly square, and consequently has the feathers nearly equal, whilst in the common one, the tail is rounded, and the two lateral feathers are nearly *three quarters* of an inch shorter than the middle ones; besides which, the central tail-feathers of the present birds are narrowly barred, and not scalloped on their margins as in *Sturnella Ludoviciana*. The nest is not covered over, and the eggs are considerably smaller, and differently marked. This species is very shy, but abundant on all the prairies; its flesh resembles that of the common bird, and is indifferent eating.

MISSOURI MEADOW-LARK, *Sturnella neglecta*, Aud.

10, 16.

Upper Missouri. Abundant.

Adult Male.

The male measures 10 inches from the point of the bill to the end of the tail, to end of claws 11¼; alar extent 16; wing from flexure 4⅞; tail 3. Third quill longest. Bill along the ridge 1 and nearly ⅜, along the edge 1⅜; tarsus 1⅝; middle toe 1, its claw ⅜; hind toe ⅜, its claw ½.

The eggs, which are usually four or five in number, measure 1⅓ inches in

Yellow-bellied Flycatcher.

Male.

Drawn from Nature by J.J. Audubon, F.R.S.T.L.S. Lith.ª Printed & Col.ª by J.T. Bowen, Philad.ª

length, by $\frac{4}{4}$ in breadth, pure white ground. The spots are more bold, larger, and of a brighter reddish colour than those of *S. Ludoviciana*, and are diffused over the whole surface, instead of being crowded toward the larger end, as is the case in the common species. The irides are brownish, and the hairs on the upper eye-lid longer and more numerous. The general colours and markings are much the same in both species, but much paler in the present one.

FAMILY VII.*—MUSCICAPINÆ. FLYCATCHERS.

GENUS II.†—MUSCICAPA, *Linn.* FLYCATCHER.

YELLOW-BELLIED FLYCATCHER.

MUSCICAPA FLAVIVENTRIS, *Baird.*

PLATE CCCCXC.—MALE.

I am indebted to my young friend SPENCER F. BAIRD, Esq., of Carlisle, Pennsylvania, for specimens of this new Flycatcher, which that gentleman and WM. M. BAIRD, Esq., accurately described in Vol. I. of the "Proceedings of the Academy of Natural Sciences of Philadelphia," (July and August 1843, Nos. 28, 29, p. 283,) and from which I have made my figure. The following account of its habits, and also the description of its specific characters, are given by the two gentlemen above indicated.

"This species was first observed in the spring of 1840, near Carlisle, Pennsylvania. During every succeeding spring since, it has been seen in greater or less numbers, and several specimens procured each year. Its habits are much like those of the other species of this genus; it frequents low thickets near small streams, is seldom found in large woods like *T. acadica* or *T. virens*, and is a very unsuspicious bird, allowing persons to approach within a short distance. It probably goes farther north than Pennsylvania to breed, having never been observed after the latter part of May or beginning of June."

* See vol. i. p. 195. † Ibid. p. 198.

YELLOW-BELLIED FLYCATCHER, *Tyrannula flaviventris*, Baird.

5 inches 4 lines, 8 inches 8 lines.

Pennsylvania. Probably found in the Allegheny Mountains and Middle Districts.

Male.

"Body rather stout. Bill broad and the sides convex. Tarsus longer than the middle toe. Wings rounded; third primary longest, fourth slightly shorter, second one line shorter than the third and two lines longer than the fifth, first shorter than the fifth, but longer than the sixth. Tail emarginate and slightly rounded.

"Bill above dark blackish-brown, beneath light yellowish-brown. Feet brownish-black. Plumage of the upper parts deep greenish-olive, crown of the head rather darker, the feathers having their centres dark brown. A narrow ring around the eye pale yellow. Lower tail coverts, abdomen, and linings of the wings, bright sulphur-yellow, deepest on the abdomen. Sides of the body, fore part of the breast, and sides of the neck, olive, lighter than the back, and inclining to yellowish on the throat. Primaries and tail feathers dark brown, the former bordered with greyish, and the latter with olive, like the back. The lower row of lesser wing coverts, and the secondary coverts darker, tipped with pale yellow, that colour forming two bands across the wing. Secondaries darker than the primaries, and edged with pale yellow.

"Length 5 inches 4 lines; extent 8 inches 8 lines; folded wing 2 inches 9 lines.

"The sexes are similar in colour, but the *female* is generally rather smaller.

"*Observations.* This strongly marked species will at once be distinguished from every other by the deep yellow of its under parts. It resembles *T. acadica* of GMELIN (*querula* of WILSON) somewhat in form, but *acadica* by comparison will be found to be a larger bird, lighter olive above, and very pale yellow beneath. The tail of *acadica* is even or slightly rounded, in this species emarginate.

"We have no specimen of *T. pusilla* of SWAINSON, but upon comparison with the description in SWAINSON and RICHARDSON'S 'Zoology of North America,' (so favourably known for accuracy,) it appears to differ in the colour of the upper parts, *pusilla* being 'intermediate between hair-brown and oil-green;' our species is of a decided olive green; the front of *pusllia* is 'hoary;' in our species dark brownish-olive; the bands on the wing greyish-white; in our species pale yellow; 'throat and breast' of *T. pusilla* 'pale ash-grey;' in this species the throat is yellow, and the breast olive tinged with yellow."

Least Flycatcher.

Male.

Drawn from Nature by J.J.Audubon, F.R.S.F.L.S.

Lith.ª Printed & Col.ª by J.T. Bowen, Philad.ª

FAMILY VII.*—MUSCICAPINÆ. FLYCATCHERS.

GENUS II.†—MUSCICAPA, *Linn.* FLYCATCHER.

LEAST FLYCATCHER.

MUSCICAPA MINIMA, *Baird.*

PLATE CCCCXCI.—MALE.

A specimen of this little Flycatcher was sent to me along with the one last described, by Mr. BAIRD, and I have found his description of it so correct that I shall give it below. Mr. BAIRD says:

"This species was first observed and procured in May 1839, near Carlisle, Pennsylvania. Since then numbers have been observed and shot on every succeeding spring. Like the preceding, (*T. flaviventris*,) this bird does not frequent deep forests, but is found among the scattering trees which border our streams. It is rather shyer than *T. flaviventris*, and does not, like that species, seek dense thickets. It also most probably goes further north to breed, as after the last of May it is no longer to be seen. It visits us from the south in the latter part of April, generally making its appearance about a week before *T. flaviventris*."

This Flycatcher has a great range through the countries bordering upon the Upper Missouri. Several specimens were procured by some of my companions, and I not unfrequently met with them in my rambles along the sides of small though interesting valleys in the ravines so numerous about the Yellow Stone river and Fort Union. In its habits it resembles the smaller species allied to itself, all of which have been already described. I have no doubt that it breeds in the sections of the country where I saw it but its nest escaped our utmost endeavours to discover it.

LEAST FLYCATCHER, *Tyrannula minima*, Baird.

5 inches 2 lines, 8 inches 3 lines.

*See vol. i. p. 195. †Ibid. p. 198.

Mountains of Pennsylvania. Shores of the Missouri. Probably ranges over all the Middle and Western Districts.

Male.

"Body rather slender. Bill smaller than the other species of the genus Tarsus slightly longer than the middle toe. Second primary longest, third nearly equal, and rather longer than fourth, fifth one line shorter than fourth, first intermediate between fifth and sixth. Tail emarginate and slightly rounded.

"*Colour.* Bill dark blackish-brown above, pale horn-colour beneath. Feet black. Plumage of the upper parts dark greyish-olive, crown somewhat darker, rump lighter and inclining to greyish. A narrow ring round the eye greyish-white. Fore part of breast, sides, and sides of the neck light ash-grey, middle of throat white, rest of the lower parts very pale yellow or yellowish-white. Primaries and tail feathers wood-brown, the former narrowly, and the latter broadly edged with olive. Lower row of lesser wing coverts and the secondary coverts darker, tipped with dirty-white, that colour forming two bands across the wings. Secondaries also dark, like the greater wing coverts, and broadly edged with yellowish-white.

Length 5 inches 2 lines. Extent 8 inches 3 lines. Folded wing 2½ inches.

"No perceptible difference as to colour or size between the sexes.

"*Observations.* This species will be recognized by its size, its slender form making it the smallest of our North American Tyrannulæ. In colour it most resembles *T. Traillii* of AUD., but it is a much smaller bird, being nearly three-fourths of an inch shorter. *T. Traillii* has the breast and sides of the neck olivaceous; in this species light ash-grey; the tail also of T. *Traillii* is even.

"It differs from *T. pusilla* (comparing with the description of SWAINSON and RICHARDSON as before) in having the wings more pointed, the second and third primaries being longest, and the first longer than the sixth; while in *pusilla* the third and fourth are longest, and the first shorter than the sixth. The upper tail coverts of *pusilla* are uniform in colour with the back; in our species lighter; *pusilla* has the front 'hoary;' in this species dark. The lower parts of *pusilla* are pale sulphur-yellow, 'approaching to siskin-green;' in our species yellowish-white; the under mandible of *pusilla* is yellowish-brown; of this species horn-colour. From the figure in the Fauna Boreali-Americana, *pusilla* appears to be a stouter bird, much deeper in colour beneath and having a broader bill. Its smaller size, and darker colour above, will distinguish it from *T. acadica* (being two-thirds of an inch shorter), which species has also longer and more pointed wings, a much larger bill, which is light brown beneath, and an even tail."

Brewers Black bird

Male

Drawn from Nature by J.J. Audubon F.R.S.F.L.S.

Lith.ª Printed & Col.ª by J. T. Bowen Phila.ª

FAMILY XVI.*—AGELAINÆ. MARSH-BLACKBIRDS.

GENUS V.†—QUISCALUS, *Vieill.* CROW-BLACKBIRD.

BREWER'S BLACKBIRD.

QUISCALUS BREWERII, *Aud.*

PLATE CCCCXCII.—MALE.

The country around Fort Union, which is situated a few miles above the confluence of the Yellow Stone river and the Missouri, consists of a large naked prairie, bounded to the eastward by a range of singular hills, both in their form and diversity of altitude. This prairie, like all others in that section of the country, is somewhat sterile, covered with a superabundance of cactus of at least two kinds, and becomes burnt and dried as early as the beginning of August. The hills themselves are more or less abrupt, stony, and yet covered with many curious species of plants. These hills extend for several miles, at about the same distance from the banks of the Missouri; along their tops or their declivities, many rare species of birds are found during spring and summer; but more are met with on the surface of the great prairie below. At moderate distances are seen more or less extensive ravines, where a few scanty dwarfish trees, and tall rough weeds or grasses, are found along the margins of the small and mostly dried up rivulets that meander through them. Reader, it is along the banks of these streamlets, and perhaps on the branches of the trees which I have mentioned, that Brewer's Blackbird may be found during almost all the morning rambles of the student of Nature. Groups of seven or eight are seen to alight on the branches in a loose manner, and in silence. They soon move upward or downward, and allow you to approach within some fifteen or twenty paces of them; and uttering their notes whilst you are watching their movements, you are at once assured that it is a species as yet unknown to the naturalists of our country, and therefore procure several of them in a few moments.

They do not evince the pertness so usually accompanying our other birds of this family, but look all the while as if unsatisfied with their present abode

* See vol. iv. p. 49. † Ibid. p. 51.

and longing for a farther removal northward. On the ground their gait is easy and brisk, and I never heard them sing, but simply emit a *cluck* not unlike that of the Common Red-winged Starling, between which and *Quiscalus ferrugineus* I would place them. Their bill is not so stout as that of the former, but more so than that of the latter. The shape of the wings and tail of this species differ materially from those of the Rusty Grackle; the first by its being longer, sharper, and having the first quill longest, and the tail being much more rounded. In the general colour those two species might agree better; but in the *Q. Brewerii*, the metallic resplendence is uniformly more brilliant, purple and blue, instead of being steel blue and green; it never shows the brownish edges of the feathers that are regularly attendant on those of the Rusty Grackle.

I think it almost superfluous to add that I have named this species after my friend THOMAS M. BREWER, Esq.; having so often mentioned his name when he was actively engaged in the study of ornithology, and my works containing numerous evidences of the assistance he has rendered both to science and to myself.

BREWER'S BLACKBIRD, *Quiscalus Brewerii*, Aud.

10, 16¼.

Found on the Upper Missouri river, and Yellow Stone, &c.

The old male measures from the point of the bill to end of tail 10 inches; alar extent 16¼; wing from flexure 5¼; bill along the ridge ⅞, along the gap ⅞. The first quill is decidedly the longest, the second and third shorter, and the rest rapidly decreasing. The bill and feet black, irides pale yellow. Tarsus 1⅛; hind toe ½, its claw ⅜; middle toe ⅝, its claw ¼.

The general colour is deep glossy black, with rich purple reflections on the head, cheeks and lower sides of the neck; after which the reflections are first blue, and afterwards green. The lower parts are slightly glossed with green. Tail 4 inches.

The female is somewhat smaller and duller in all its tints. Bill to end of tail 9⅛ inches; wing from flexure 4⅞.

Shattucks Bunting?

Male.

Drawn from Nature by J.J.Audubon.F.R.S.F.L.S. Lith.ª Printed & Col.ª by J.T.Bowen. Phila.ª

FAMILY XV.*—FRINGILLINÆ. FINCHES.

GENUS II.†—EMBERIZA, *Linn.* BUNTING.

SHATTUCK'S BUNTING.

EMBERIZA SHATTUCKII, *Aud.*

PLATE CCCCXCIII.—MALE.

This handsome little species is found quite abundant throughout the country bordering on the Upper Missouri. It inhabits with particular partiality the small valleys found here and there along the numerous ravines running from the interior, and between such hills as I have already mentioned. Its usual demeanour resembles much that of the Chipping Bunting, *Emberiza socialis* of WILSON, and like it, it spends much of its time in singing its monotonous ditties; whilst its mate is engaged in the pleasing task of incubation. When approached it will dive and conceal itself either amid the low bushes around, or will seek a large cluster or patch of wild roses, so abundant in that section of country, and the fragrance of which will reach the olfactory nerve of the traveller or gunner for many paces.

The nest of the Shattuck Bunting is usually placed on a small horizontal branch, seven or eight feet from the ground; and I believe is occasionally placed in the broken and hollow branches of trees. The eggs, four or five in number, are blue, spotted with reddish-brown toward the large end, and placed in a nest so slightly formed of slender grasses, circularly lined with horse or cattle hair, as to resemble as much as possible the nest of the species to which it is allied.

I have great pleasure in naming this species after my worthy young friend GEORGE C. SHATTUCK, Esq., M.D., of Boston, one of the amiable gentlemen who accompanied me on my voyage to the coast of Labrador.

SHATTUCK'S BUNTING, *Emberiza Shattuckii*, Aud.

$5\frac{9}{16}$, $8\frac{1}{16}$.

* See vol. iii. p. 49.

† Ibid. p. 58.

Abundant throughout the country bordering the Upper Missouri.

In the male, the bill is cinnamon colour, darker towards the extremities, the lower mandible lighter. A medial line and a collar passing back of the head and running behind the cheeks, light bluish-grey; a line over the eyes, another running from the lower mandible and the throat, white. Cheeks, rest of the head, and upper parts of the back, dull yellowish-brown streaked with brownish-black. Rump greyish-brown without streaks; two bands of pale yellowish on the wings. The second primary longest. Wings brownish, edged with whitish or pale dull yellow. Tail dull brown, the feathers edged with paler. Sides dull yellowish-brown, the middle of the lower parts much lighter. A small streak of blackish runs from the lower corner of the inferior mandible, legs and feet cinnamon colour.

From point of bill to end of tail $5\frac{9}{16}$ inches; alar extent $8\frac{1}{16}$; wing from flexure $2\frac{7}{16}$; tail $2\frac{5}{8}$; tarsus nearly $\frac{5}{8}$. Eye brown.

FAMILY XXVI.*—PICINÆ. WOODPECKERS.

GENUS I.†—PICUS, *Linn.* WOODPECKER.

MISSOURI RED-MOUSTACHED WOODPECKER.

PICUS AYRESII, *Aud.*

PLATE CCCCXCIV.—MALE.

This handsome new species was first discovered in the woody borders along the shores of the Upper Missouri, near Fort Union, and both my friends HARRIS and BELL procured several specimens, including an adult pair. Mr. BELL also discovered its nest-hole, and on having it cut down, we found six young birds of this species already fledged, and having the red moustache of the old male.

Although this bird is considerably larger than the *Picus auratus*, so common in our Eastern States, its flight and general habits are much the

* See vol. iv. p. 211. † Ibid. p. 212.

Missouri Red-moustached Woodpecker.

Male.

1

Drawn from Nature by J.J.Audubon F.R.S.F.L.S. Lith.d Printed & Col.d by J. T. Bowen, Philad.a

same, but there exists some difference in its notes. The bill is considerably less curved, and the markings, though much like those of the latter, differ in the rounded spots that ornament the lower part of the body, are much less in size, and incline downward, instead of being placed crossways; and although the *third* quill is the longest in both, in the present species, the first is much shorter.

I have named this handsome bird after my young and learned friend W. O. AYRES, Esq., who is well known to science as an excellent ichthyologist; and who also is well conversant with the birds of our country.

MISSOURI RED-MOUSTACHED WOODPECKER, *Picus Ayresii*, Aud.

12½, 20.

Valleys and ravines of the prairies of the Upper Missouri.

In the Adult Male, the upper part of the head, cheeks, throat downward to near the black patch, of an iron-grey tinged with reddish-buff; lores and around the eye brighter; a transverse very narrow band of carmine on the hind neck; back, scapulars, and secondaries light reddish-brown, tinged with dull green, transversely spotted with black; rump white; tail coverts white, with black markings; primaries and tail feathers blackish-brown, the shafts yellow. A red moustache or streak on each side of the throat from the edge of the lower mandible; lower parts reddish-white, and spotted with black, as well as a large semilunar patch on the fore part of the breast; lower surface of quills and tail feathers yellow, the latter black toward the end.

The female is similar to the male, somewhat smaller, but without the red patch or moustache on the sides of the throat.

Bill to end of tail $12\frac{7}{16}$ inches; alar extent 20; wing from flexure $6\frac{6}{16}$; bill along the ridge $1\frac{1}{4}$, along the edge rather more than $1\frac{1}{2}$; tarsus $1\frac{1}{8}$; middle toe 1, its claw $\frac{1}{4}$; hind toe $\frac{3}{4}$, its claw $\frac{3}{8}$; tail $4\frac{7}{8}$.

FAMILY IV.*—CAPRIMULGINÆ. GOAT-SUCKERS.

GENUS I.†—CAPRIMULGUS, *Linn.* GOAT-SUCKER.

NUTTALL'S WHIP-POOR-WILL.

CAPRIMULGUS NUTTALLII, *Aud.*

PLATE CCCCXV.—MALE.

How little did I think whilst at Edinburgh, in the year 1839, that I would have found and procured Nuttall's Whip-poor-will, in the course of my rambles on the Upper Missouri, in the year 1843. At the former date I gave an intimation of the existence of such a bird in my fifth volume of Ornithological Biographies, at page 335, to which you, reader, may refer if you please.

On Thursday the 7th of September, 1843, we were forced to land our boat on the eastern side of the Missouri river, on account of the wind, which at that time blew too high for us to proceed; for, reader, whenever the wind is strong, the waters of the Missouri become at once ruffled, and the navigation by no means secure. We halted at a place where we thought we could spend the time in hunting, with some advantage, and the moment our Mackinaw boat was tied to the trees on the shore, each man, bearing a gun, sallied forth in search of such game as I was anxious to procure. Elks were abundant, and we saw a great number of them; some were snapped at within a few paces, others were shot at at considerable distances; but Mr. CULBERTSON, (the superintendent of Fort Union, who accompanied us as far as Fort Pierre, and his Indian wife and young son who were of the party,) had the good fortune to shoot and kill a fine young male, of which I will speak elsewhere. The woods were thickly matted and difficult of ingress; some went up the river, whilst others followed a contrary course; some Sharp-tailed Grouse were started, shot at, and brought to our camp. In the course of the night the wind blew so violently, that all on board resorted to the shore, MRS. CULBERTSON leaping first on shore with her babe in her arms,

* See vol. i. p. 150. † Ibid.

Nuttall's Whip-poor-will

Male

Drawn from Nature by J.J. Audubon, F.R.S.F.L.S.

Lith.d Printed & Col.d by J. T. Bowen Phila.a

when she in a few moments found a shelter of willow branches, &c., under which both remained until the storm had subsided.

The next morning the wind was still blowing too hard for us to proceed, and as on the former day, the hunters went off in many directions. Mr. J. G. BELL, on his return from a walk up the river shore, where he had shot some Wild Pigeons, started the individual now before you from the ground. It flew a few yards, and my young companion took it for our common Whip-poor-will; but on its second rising and flying again before him, he saw that it was a much smaller bird, fired at it, and fortunately brought it to me, fresh and beautiful though dead.

On the evening of the next day, about ten o'clock, my friend HARRIS called me to hear the notes of this bird. We had removed to an island a mile or so below where the Whip-poor-will had been procured; and on ascending the bank and entering the dried, rank grass of the prairie, the notes of the birds came at once on our ears, for there were two of them, both anxiously desirous, one might have thought, to convey to us all that they could perform in lieu of a song. The sounds we heard, were indeed those of a Whip-poor-will, cut short of much of their compounds, for it was reduced to the syllables *Oh-will, Oh-will, Oh-will,* repeated often and as quickly as is the fashion of our own common species.

Those Birds were then on their passage southward, and I regret to say that nothing can *now* be added to their habits. I am also sorry that no specimens of the female were seen or procured.

This pretty species I have, as you perceive, named after my friend THOMAS NUTTALL, whose worth as a man and a scientific naturalist, are both so well known.

NUTTALL'S WHIP-POOR-WILL, *Caprimulgus Nuttallii*, Aud.

7¼.

Prairies of Western Missouri, and the Northern territories.

Adult Male.

Bill black, iris dark hazel. Feet reddish-purple, the scales and claws darker. The general colour of the upper parts is dark brownish-grey, lighter on the head and medial tail feathers, which extend beyond the others half an inch, and all of which are streaked and minutely sprinkled with brownish-black and ash-grey. The quills and coverts are dull cinnamon colour, spotted in bars with brownish-black; the tips of the former mottled with light and dark brown. Three lateral tail feathers barred with dark brown and cinnamon, and tipped with white. Throat brown, annulated with black, a band of white across the fore neck; beneath the latter black mixed

with bars of light yellowish-grey and black lines; under tail coverts dull yellow.

Total length 7½ inches; bill along the edge ⅞; wing from flexure 5¾. Second quill longest, third almost equal. Tail to the end of the upper feathers 3½; tarsus ⅝; middle toe ⅝, its claw ¼. Strongly pectinated.

FAMILY XXIX.*—COLUMBINÆ. PIGEONS.

GENUS I.†—COLUMBA, *Linn.* DOVE.

TEXAN TURTLE-DOVE.

COLUMBA TRUDEAUII, *Aud.*

PLATE CCCCXCVI.—MALE.

I am indebted for this new species to my companion Mr. J. G. BELL, who received it from Texas; but, unfortunately, no notes connected with the habits of this handsome Dove were forwarded by the person who procured it.

In naming it after my excellent friend Doctor TRUDEAU, of New York, I only pay another very slight tribute to his great attainments as an accomplished ornithologist and student of nature.

TEXAN TURTLE-DOVE, *Columba Trudeauii*, Aud.

10½.

One specimen, procured in Texas.

Male.

Upper part of the head and neck purplish, with rich reflections of golden-green on the hind parts; a black spot on the sides of the throat, and bill black; throat and neck purplish-buff; sides and under wing coverts ash-grey, as well as the lower tail coverts; vent white; shoulders, back and two middle tail feathers, brownish-olive; a large patch of white formed by the first row

* See vol. iv. p. 311. † Ibid. p. 312.

The Texan Turtle Dove.

Male.

Drawn from Nature by J.J.Audubon.F.R.S.F.L.S. Lith.ª Printed & Col.ª by J.T.Bowen Philad.ª

Western Shore Lark

Male.

Drawn from Nature by J.J.Audubon F.R.S.E.L.S.

Lith.ª Printed & Col.ª by J. T. Bowen. Phila.ª

of small coverts, and several of those adjoining. Primary quills brownish-black edged with white, secondaries much darker and more broadly edged and terminated by white; tail feathers light blue, with a narrow band of black, terminating in a broad white band. Third quill longest, the first and second nearly equal.

Total length about 10½ inches; wing from flexure 6¼; bill along the ridge ⅝, along the edge 1; tarsus 1; middle toe 1, its claw ⅜; hind toe ⅝, its claw ¼; the tail, which is slightly rounded, measures 4½. The female remains unknown.

FAMILY XIV.*—ALAUDINÆ. LARKS.

GENUS I.†—ALAUDA, *Linn.* LARK.

WESTERN SHORE LARK.

ALAUDA RUFA, *Lath.*

PLATE CCCCXCVII.—MALE.

Here, reader, is another of those species which, by its general habits as well as appearance, I did not notice until this moment; afraid, indeed, of promulgating an error myself before the world of naturalists that exist, and who do not excuse an error, unless indeed that error is committed by themselves. Now, however, that years have elapsed, and that in the meantime I have had ample opportunities of watching this species, and of comparing it with our *Alauda alpestris*, I have not hesitated to figure it, and present it to you as a good species, not hitherto placed in my works on the ornithology of our country.

This species is quite common on all the western prairies which I lately visited, and is also found in Texas, as well as in several portions of South America. It breeds on the prairies, forming its nest somewhat imbedded in the ground, and raises only one brood in a season. As I have already said,

* See vol. iii. p. 43. † Ibid. p. 44.

in all its habits, its manner of flight, &c., it resembles the *Alpestris*. It differs, however, materially from the latter, by its smaller size, and by having the whole of its tail feathers of the same dark colour, unlike, in that particular, its relative, which has the two middle ones of the same light colour as the coverts of that part.

WESTERN SHORE LARK, *Alauda rufa*, Lath.
ALAUDA FLAVA, Gmel.
LA CEINTURE DE PRETRE, *Petite aloutte de Buenos Ayres*, Buffon, Pl. Enl. 650, fig. 2.

5½.

Western States, and generally distributed.

Male with two erectile pointed tufts of feathers on the anterior lateral parts of the head. Upper parts dusky-brown, the feathers paler on the edges; on the forehead a recurved crescentic band of black; another curved downwards, proceeding on its side from the base of the upper mandible; a band of white on the eye; throat pale yellow, with a broad black patch on the lower neck, the rest of the lower parts brownish-white; quills dusky. tail feathers blackish.

Total length about 5½ inches; wing from flexure 4. Second quill longest. Bill along the ridge $\frac{3}{8}$, along the edge $\frac{1}{2}$; tarsus $\frac{3}{4}$; middle toe $\frac{1}{2}$, its claw $\frac{1}{4}$; hind toe $\frac{1}{4}$, its claw $\frac{3}{8}$. Bill, feet and claws, black, irides hazel.

The female is somewhat smaller, but is marked as in the male. The lateral tail feathers of the latter are edged outwardly with dull white.

The eggs, four or five in number, measure $\frac{7}{8}$ of an inch in length by $\frac{5}{8}$ in breadth. The ground colour is light blue, freckled all over with light umber spots, so thickly concentrated towards the larger end as entirely to conceal the general colour.

Common Scaup Duck.

Drawn from Nature by J.J.Audubon,FRS.FLS.

1. Male 2. Female.

Lith.ª Printed & Col.ª by J.T.Bowen, Phila.ª

FAMILY XXXIX.*—ANATINÆ. DUCKS.

GENUS V.†—FULIGULA. SEA-DUCK.

COMMON AMERICAN SCAUP DUCK.

FULIGULA MARILA.

PLATE CCCCXCVIII.—MALE AND FEMALE.

It is extremely curious that none of the authors who have written on the ornithology of our country, should have discovered that, independent of the subject which forms this article, another species of Scaup Duck also exists, and that abundantly too, throughout the United States.

ALEXANDER WILSON figured a Scaup Duck, but in his description of the adult in winter, he says that the "irides" are "reddish," and yet he says that the Scaup Duck is well known in England. Until about two years since, I thought that I had given the history of the Common Scaup Duck, but find now that I have been mistaken, and that all that I have said of "*Fuligula Marila*,"‡ must now be applied to *Fuligula mariloides* of VIGORS. The bird which has been described in my Ornithological Biographies, and figured in my large plates, being in fact the *Fuligula mariloides* of VIGORS, who described from a specimen procured during BEECHEY'S voyage. In a note to page 31, Doctor RICHARDSON, who found this latter species, speaks of it as being smaller, but does not point out any specific differences between the two birds; and to WILLIAM YARRELL, Esq., of London, is now due the knowledge of this species, which he has characterized and described in such a manner as to render it for ever a good and true species, differing from the *Fuligula Marila* in size, being considerably smaller than the latter, the form of its bill, the colouring of the terminal feathers of the head, &c. &c.

About two years ago, my attention was called to notice the typical Scaup Duck, by Mr. JOHN G. BELL, of whom I have already spoken, when I

* See vol. vi. p. 167. † Ibid. p. 198.
‡ See vol. vi. p. 316.

plainly saw the difference between the two species, but could not figure the typical Scaup Duck at the time. I believe, however, that it was described by Mr. GIRAUD, whose paper was read by himself before the members of the Lyceum of Natural History of New York. I do not know whether or not Mr. GIRAUD gave a new name to this species, and it does not signify, as it is now well established by Mr. YARRELL of London, as above stated, that it is the *Fuligula Marila*, and that our smaller species is the *Fuligula mariloides* of VIGORS.

Mr. BELL has kindly sent me specimens in the flesh, and fresh, from which I have figured the male and female, and taken very exact measurements, weight, &c. Mr. VIGORS, in speaking of these two species, says: "Several specimens of a bird nearly allied, if not the same, were brought home by the expedition. They uniformly differ from the typical *Fuligulu Marila* in their smaller size; in the black colour on the breast being less intense and defined; in the undulating white markings being less diffused over the scapulars and back, and being wanting almost entirely on the wing-coverts."

COMMON AMERICAN SCAUP DUCK, *Fuligula Marila.*

18⅜, 32.

Shores of Long Island, and generally distributed.

Adult Male in January.

In this species the bill is narrower at the base than at top by nearly one-third. It is of a pale blue colour, the unguis rather large, hooked at the point and black. The irides bright yellow; the whole head and neck, as well as the upper part of the breast and back, black; cheeks and sides of neck glossed with rich reflections of green, the rest of the back and scapulars striped in zigzag and well divided lines of black on a white ground; wing-coverts darker grey than the back; primaries brownish-black; the secondaries white, forming the speculum, and tipped with black narrowly edged with white. Rump and upper tail-coverts black; tail feathers brownish-black; breast, sides below the wing, and the flanks, pure white; the belly behind the legs undulated with greyish lines on a dull whitish ground; legs and toes bluish-black, the membranes darker.

Bill along the ridge 2¼ inches, along the edge 2, to pinion 10½, to end of claws 20⅜; flexure of wing 8¼; bill to end of tail 18⅜; alar extent 32; claws beyond the tail 2⅛. First quill longest. Tail of 14 feathers 2⅝ in length. Weight 2 pounds avoirdupois.

The Female is somewhat smaller, the head and neck dark brown, the bill as in the male, as well as the irides; around the base of the bill a broad band

Common Troupial.

Male.

Drawn from Nature by J.J. Audubon F.R.S.F.L.S.

Lith.d Printed & Col.d by J. T. Bowen, Phila.a

of white; the lower part of the neck and breast dark brown, the back and scapulars light grey, transversely barred with irregular dusky lines; the primaries dark brown; the secondaries white, tipped with brown; legs and feet as in the male.

FAMILY XVI.*—AGELAINÆ. MARSH-BLACKBIRDS.

GENUS IV.†—ICTERUS, *Briss.* HANGNEST.

COMMON TROUPIAL.

ICTERUS VULGARIS, *Daud.*

PLATE CCCCLXCIX.—MALE.

This handsome bird was first observed at Charleston, South Carolina, by my son, JOHN WOODHOUSE, who shot and figured a male the size of nature; the bird when first seen was perched on the point of a lightning-rod close by the house of my friend the Reverend JOHN BACHMAN, D. D. A few days afterwards others were seen, but although a female was shot, it fell in the river and was lost. I am informed that since that period, small groups of four or half a dozen make their appearance in the same city, and on the neighbouring islands. It is a common species in almost every portion of South America, where, according to DAUDIN, they associate in large flocks, and build a large pensile nest. This bird is very easily tamed, and becomes so gentle as to suffer itself to be handled by its master. The sharpness of their bill, however, renders them somewhat disagreeable as pets, for in many instances they have been known to inflict severe wounds, especially on children.

COMMON TROUPIAL, *Icterus vulgaris*, Daudin.
COMMON TROUPIAL, *Coracias xanthornus*, Scopoli.
COMMON TROUPIAL, *Yellow and Black Pye*, Catesby. (Appendix.)

* See vol. iv. p. 9. † Ibid. p. 36.

COMMON TROUPIAL, *Banana Bird*, Albin. Ave. II. tom. 40.
COMMON TROUPIAL, *Le Troupiale vulgaire*, Buffon, Pl. Enl. 532.

10, 12¾.

Observed occasionally at and near Charleston, S. C. Common in South America.

Male.

Total length 10 inches; alar extent 12¾. Bill, a patch of skin around the eye and reaching the edge of the upper mandible, as well as the legs and feet, blue. Eyes bright yellow, inclining to silvery; claws black. The whole head, neck and upper breast, as well as the back, scapulars, and primary quills, jet black, with bluish reflections on the head. Rump, upper and lower tail-coverts, as well as the whole under part of the body, and a collar around the neck, as well as a patch on the wings, black; pinion of a bright yellowish-orange colour; tail even and black. The secondary coverts largely tipped, and the quills margined with white, forming a very conspicuous patch of that colour; second quill longest. Wing from flexure 4⅛ inches; bill along the ridge 1⅛, along the edge rather more than 1¼; tarsus ⅛; hind toe ½, its claw ½; middle toe 1, its claw ⅜. Tarsus and feet, as well as the claws, strong and well adapted to their habits.

Bairds Bunting?

Male.

Drawn from Nature by J.J.Audubon FRSFLS

Lith.ª Printed & Col.ª by J. T. Bowen. Philad.ª

FAMILY XV.*—FRINGILLINÆ. FINCHES.

GENUS II.†—EMBERIZA, *Linn.* BUNTING.

BAIRD'S BUNTING.

EMBERIZA BAIRDII, *Aud.*

PLATE D.—ADULT MALE.

During one of our Buffalo hunts, on the 26th July, 1843, we happened to pass along several wet places, closely overgrown by a kind of slender rush-like grass, from which we heard the notes of this species, and which we thought were produced by Marsh Wrens, (*Troglodytes palustris,*) and my friends HARRIS and JOHN G. BELL immediately went in search of the birds. Mr. BELL soon discovered that the notes of Baird's Bunting were softer and more prolonged than those of the Marsh Wren. They had much difficulty in raising them from the close and rather long grass, to which this species appears to confine itself; several times Mr. BELL nearly trod on some of them, before the birds would take to wing, and they almost instantaneously re-alighted within a few steps, and then ran like mice through the grass. After awhile, however, two were shot on the wing, and both fortunately were found, and proved to be an adult male and female. We found this species abundant in all such situations as I have mentioned above, and doubtless it breeds in them.

I have named this species after my young friend SPENCER F. BAIRD, of Carlisle, Pennsylvania.

BAIRD'S BUNTING, *Emberiza Bairdii*, Aud.

Wet portions of the prairies of the Upper Missouri.
Male.
Bill stout and longish; wings rather long and broad, the second quill the

* See vol. iii. p. 49. † Ibid. p. 58.

longest, and the four first nearly equal; tail emarginate and rounded, with the feathers acute. Upper parts light yellowish-brown, streaked with brownish-black; the margins of the feathers on the back and scapulars slightly tinged with light reddish-cream colour, the edge of the wing paler, as well as those of the tail feathers. A broad streak of reddish-cream colour on the centre of the head, surrounded by rows of blackish-brown, as well as a line from the corner of the lower mandible; a semilunar line of spots and streaks of the same on the upper part of the breast and sides of the body. Legs and feet very stout and rather long, claws long, slender, curved, and acute. Bill horn colour toward the tip and dull yellow; cheeks and all under parts pale dull yellowish-white.

Bill along the ridge $\frac{1}{2}$ inch, along the edge $\frac{5}{8}$; wing from flexure 2 inches and $\frac{3}{4}$; tail $2\frac{1}{8}$; tarsus $\frac{7}{8}$; hind toe $\frac{3}{8}$, its claw $\frac{3}{8}$; middle toe $\frac{5}{8}$, its claw $\frac{1}{4}$. The whole light flesh colour and transparent, eye hazel.

THE END.

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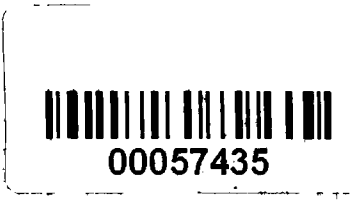

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